# Cancer rehabilitation

Nation-wide guideline, Version: 2.0

Last changed: 01-11-2017

Method: Evidence based

Justification: IKNL

# Table of contents

# Table of contents

# Table of contents

# General

**Literature review:**
In 2011, the first national evidence-based guideline on cancer rehabilitation was published in the Netherlands.
In light of subsequent developments, in 2013 the Netherlands Society of Rehabilitation Medicine (NSRM) submitted a request to the Quality Foundation of the Dutch Medical Specialists (SKMS) for financing for a revision of part of this guideline.
Following consultation with the Netherlands National Health Care Institute, the title of the revision was changed from the original 'Guideline on Cancer Rehabilitation' to 'Guideline on Specialised Medical Rehabilitation in Oncology'. This was prompted by the appearance of the report entitled 'Specialised Medical rehabilitation: care that rehabilitation physicians are committed to providing' (*Medisch-specialistische revalidatie zorg zoals revalidatieartsen plegen te bieden*).
The questions to be reviewed are described below; they are based on an inventory carried out among involved professionals, patients and ex-patients. As well as the contributions from SKMS (NSRM), the development of this guideline has been made possible through financial contributions from A-Care and the Netherlands Comprehensive Cancer Association (IKNL). After the request had been approved, a multidisciplinary guideline development group embarked on the task. Process management was carried out by IKNL in collaboration with META for methodological management and secretarial support for the process.

Specialised Medical Rehabilitation in Oncology: a detailed description
Specialised medical rehabilitation in oncology is a form of interdisciplinary *outpatient* treatment that is focused on maximising the autonomy and participation of patients and ex-patients with diverse inter-related problems of functioning at the physical, cognitive, emotional or social levels and/or related to role functioning and/or life orientation, as a consequence of having, or having had, cancer and/or the cancer treatment.
Specialised medical rehabilitation in oncology falls within the area of expertise of rehabilitation medicine. This means that a rehabilitation physician decides who is eligible for coordinated interdisciplinary cancer rehabilitation care on the basis of patient needs, problems of functioning and the feasibility of the treatment goals. Specialised medical rehabilitation in oncology is a relatively new and developing area of professional expertise.
Specialised medical rehabilitation treatment in oncology takes place on an outpatient basis and is delivered by an interdisciplinary team of care professionals, coordinated by a rehabilitation physician.
This care does not include other forms of care that fall outside the definitions of specialised medical rehabilitation, such as care provided by one or more monodisciplinary health care professionals, even though the term rehabilitation is often used to describe these.

<u>What is the guideline about?</u>
There are physical, cognitive, emotional or social problems and/or with regard to role functioning and/or giving meaning in daily oncological practice. These problems can, after screening and discussion, lead to referral of the cancer patient in question or who has had cancer. The (former) patient can be referred for further diagnostics, lifestyle advice, treatment by one psychosocial or paramedical care provider, by care providers from different disciplines, or to medical specialist rehabilitation. The guideline describes how to make a good reference to specialised medical rehabilitation in oncology.
In addition, the guideline describes:

- Symptoms after curative treatment and in the palliative phase
- Predictive factors for a healthy lifestyle
- The intake process prior to specialised medical rehabilitation in oncology
- Rehabilitation (interventions)
- Measurement instruments for effect evaluation
- Empowerment of the patient
- Support/advice/(nursing) interventions aimed at work
- Cost effectiveness
- Organisation of care
- Screening and follow-up care/rehabilitation care for vulnerable (often) older patients with cancer

Target population

The Guideline on Specialised Medical Rehabilitation in Oncology is aimed at patients aged 18 years and older. The guideline includes patients during or after cancer treatment with curative intent, and those who are at the palliative phase of any oncological condition. Where the patients are at the palliative phase (the phase at which it becomes clear that there is no longer any question of cure), the guideline focuses on the disease-oriented and symptom-oriented palliative phase, and explicitly not on the phase of terminal palliation.

Target group

The guideline targets both primary oncological treating professionals (internist-oncologists, oncological surgeons, oncological radiologists, nurses, nurse specialists, physician's assistants, general practitioners and occupational health physicians), and those professions involved in psychosocial, paramedical and rehabilitation care. Key questions 1 and 3 are of particular interest to primary oncological treating professionals (internist-oncologists, oncological surgeons, oncological radiologists, nurses, nurse specialists, physician's assistants, general practitioners and occupational health physicians), as these are the identifiers and referring professionals. Key questions 2 to 5 are of particular importance to those professionals concerned with psychosocial, paramedical and specialised medical rehabilitation care (rehabilitation physicians, physiotherapists, psychologists, social workers, occupational therapists).

How did the guideline come about?

The initiative for this guideline comes from the Dutch Association of Rehabilitation Physicians (VRA). The guideline was drawn up by a multidisciplinary committee with representatives from rehabilitation doctors, physiotherapists, psychologists, nurses, occupational and company doctors, surgeons, internist-oncologists, radiotherapists, occupational therapists, sports doctors and geriatric specialists. It is described for each module which associations have been involved in the development of the specific module.

More information about

- Clinical problem analysis 2017, 2011 en 2008 (see appendix 1)
- Interactice work conference 2008 (see appendix 2)
- Key questions 2017 en 2011 (see appendix 3)
- Definitions and scope (see appendix 4)
- Project and development group composition (see appendix 5)
- Members of the project and guideline working group and advisors (see appendix 6)
- Conflict of interest guideline working group members (see appendix 7)
- Authorising associations and associations/institutions involved 2017 and 2011 (see appendix 8)
- Testing the guideline (recommendations) with (ex)patients with cancer 2011 (see appendix 10)
- Scientific argumentation (see appendix 11)
- Actualisatie en houderschap van de richtlijn (see appendix 16)
- Juridische betekenis (see appendix 17)
- Verantwoording (see appendix 18)
- Implementation and evaluation (see appendix 19)
- List of abbrevation (see appendix 21)
- Goals of specialised medical rehabilitation in oncology (see appendix 22)
- Literature search Intake (see appendix 23)
- Evidence tables Intake (see appendix 24)
- Literature search healthy lifestyle (see appendix 25)
- Evidence tables healthy lifestyle (see appendix 26)
- Literature search effectiveness rehabilitation (see appendix 27)
- Evidence tables effectiveness rehabilitation (see appendix 28)
- Evidence tables work (see appendix 29)
- Literature search work (see appendix 30)
- Evidence tables cost-effectiveness (see appendix 31)
- Literature search cost-effectiveness (see appendix 32)
- Decision trees

Key questions

In order to be able to address the main problems and difficulties encountered in actual rehabilitation practice, and in the care and follow-up care of cancer, at the end of 2013 an inventory of these problems was carried out by means of a digital questionnaire which was sent to involved professionals, patients and ex-patients. Based on this problem inventory, the guideline development group decided to consider and review the questions below. In answering Key Question 1, it was decided to refer to the evidence-based guideline Screening for Psychological Distress. The rest of the questions were considered and reviewed in accordance with either the Dutch platform EBRO system (questions 2 and 3) or the GRADE system (questions 4 and 5). This is because these questions relate to describing the effectiveness of an intervention.

1. Which instrument is both valid and suitable for use in the Netherlands for the screening and discussion of symptoms both during and after completion of treatment with curative intent and during the disease and symptom-oriented palliative phase?
2. How should intake prior to coordinated interdisciplinary rehabilitation care be structured in order to determine the most suitable rehabilitation care for each individual patient?
3. What are the barriers and facilitators or characteristics related to the independent adoption or maintaining of a healthy lifestyle by cancer patients?
4. How effective are rehabilitation interventions delivered during treatment of cancer with curative intent on quality of life, role functioning, physical condition, continuing with medical treatment, and fatigue?
5. How effective are support, advice and interventions (nursing and otherwise) which are focused on work during and after completion of treatment of cancer with curative intent on participation in work, quality of life, daily activities, fatigue and cognitive functioning?

An overview of the key questions and the relevant members of the guideline development group can be seen in Table 1.

**Table 1. Key questions in Guideline on Specialised Medical Rehabilitation in Oncology (version 2.0)**

| No. | CB or EB* | Section | Authors |
|---|---|---|---|
| 1 | EB, revision | Which instrument is both valid and suitable for use in the Netherlands for the identification and discussion of symptoms both during and after completion of treatment with curative intent and during the disease and symptom-oriented palliative phase? | Dr J.P. van den Berg<br>Prof. Dr E. Boven,<br>Ms T. Brouwer<br>Ms E.B.L. van Dorst,<br>Ms Y. Engelen<br>Dr J.E.H.M. Hoekstra-Weebers<br>Dr M.M. Stuiver<br>S.L. Wanders |
| 2 | EB, revision | How should intake prior to coordinated interdisciplinary rehabilitation care be structured in order to determine the most suitable rehabilitation care for each individual patient? | Dr J.P. van den Berg<br>Ms T. Brouwer<br>Dr J.E.H.M. Hoekstra-Weebers<br>Dr M.M. Stuiver |
| 3 | EB, new | What are the characteristics of independent adoption/maintaining of a healthy lifestyle (i.e. physically active, healthy diet, abstinence from smoking, limited alcohol intake, healthy body weight) in patients who have been treated for cancer? | Dr J.P. van den Berg<br>Prof. E. Boven<br>Ms T. Brouwer<br>Ms E.B.L. van Dorst<br>Dr J.E.H.M. Hoekstra-Weebers<br>Dr M.M. Stuiver |
| 4 | EB, revision | How effective are rehabilitation interventions delivered during cancer treatment with curative intent on quality of life, role functioning, | Ms J.M.G. Fijn<br>Dr J.E.H.M. Hoekstra-Weebers<br>Dr M.M. Stuiver |

| | | | |
|---|---|---|---|
| | | physical condition, continuation with medical treatment, and fatigue? | S.L. Wanders |
| 5 | EB, new | How effective are support, advice and interventions (nursing and otherwise) which are focused on work during and after completion of treatment of cancer with curative intent on participation in work, quality of life, meaningful daily activities, fatigue, and cognitive functioning? | Dr D.J. Bruinvels<br>Ms E.B.L. van Dorst<br>Ms Y. Engelen<br>Ms J.M.G. Fijn |

* EB=evidence based

# Symptoms

**Literature review:**
It appeared during the search for evidence that within the framework of cancer rehabilitation it was not effective nor possible to answer the subquestion ‘Which complaints occur during the treatment with curative intent of cancer patients'. The guideline ‘Cancer rehabilitation' focuses on complaints for which cancer rehabilitation may be a worthwhile intervention and on complaints commonly experienced by patients, more or less independent of the type of tumour. During the treatment usually an inseparable mix of complaints occurs; there are those that occur directly and temporarily during treatment with curative intent, there are side effects of treatment and there are long-term complaints for which cancer rehabilitation may be worthwhile. The guideline working group has therefore decided to leave the ‘during treatment' disease phase out of consideration. This chapter first describes complaints that occur in patients with cancer after completing treatment with curative intent and subsequently complaints that occur during the (disease- and symptom-focused) palliative phase.

This chapter is subdivided into subchapters and/or paragraphs. Click in the left column on the subchapter and/or paragraph title in order to view the contents.

## After curative treatment

**Recommendations:**
**Recommendations**
It is recommended to pay extra attention during the follow-up of patients, after treatment of cancer, in the anamnesis and physical examination to the long-term side effects and late effects of the treatment of cancer, because these effects have a negative influence on the quality of life for a growing number of long-term survivors.
Long-term and late effects of the treatment of cancer that need to be taken into account are especially: long-term (often severe) fatigue, depression, anxiety and a poorer physical health in general that comes to expression as reduced physical functioning and loss of fitness.

The guideline working group recommends recording findings in relation to long-term side effects and late effects of treatment carefully in the medical file.

**Literature review:**
Accountability for the literature selected
Complaints that remain after treatment with curative intent may be the result of persistent side effects from treatments applied for specific forms of cancer. Examples of this are speech defects after the treatment of head and neck tumours, lymphoedema after the treatment of breast cancer, changes in sexuality after treatment of gynaecological tumours or after prostate cancer. While specific complaints with specific forms of cancer are certainly relevant considerations in cancer rehabilitation, it is assumed that this requires specific expertise. This expertise is primarily the responsibility of the specialties involved and therefore forms part of specialty education and training. The treatment of long-term side effects and late effects that occur with specific tumours will generally be addressed in the protocols and guidelines for these specific forms of cancer. For this reason, these more specific side effects have not been incorporated in this guideline. A total of three searches with a range of search terms were conducted (see appendix 12). This often yielded small population studies, often descriptive, with variable results. To ensure adequate reliability in answering the research question, a selection was made for larger studies in which the confidence intervals had been calculated, and which incorporated more than 200, and usually more than 1000 cancer survivors (see evidence table number 1).

Comparing cancer survivors to the general population
Survivor cancers have a poorer health compared to the general population. It appears from a population-based sample amongst the American population, that it is more common for cancer survivors to have a poorer health (odds ratio (OR) 2.97; confidence interval (CI) 2.6, 3.4) and psychological problems (OR 2.2; CI 1.7, 2.8) than otherwise comparable persons without cancer[106]. Survivors of Hodgkin's disease

had more complaints of fatigue than the control group from the general population. Survivors of Hodgkin's disease especially indicated long-lasting fatigue (>6 months) (61% versus 31%)[150]. In an American study amongst 1957 survivors of breast cancer, survivors indicated the same frequency of fatigue on average, but a third of them had a more than severe form of fatigue, which was associated with more depressive complaints, pain and sleeping disorders[20]. In another American study, survivors of breast cancer did indicate a lower general health and physical functioning, as well as more role limitations. This study found some cultural differences in the nature and severity of the complaints[197]. In an American questionnaire amongst 1904 cancer survivors and 2214 control subjects from the general population, it was more common for cancer survivors to report recurring pain (34 versus 17%) and depression or anxiety (26 versus 15%). The presence of comorbidity worsened the complaints[156]. It is striking that survivors of breast cancer indicated a somewhat better health (72 versus 69 on the standardised SF-36 score) and less physical pain, but did indicate a somewhat poorer mental health (79 versus 81)[203]. It is also known from other studies that surviving a serious illness can lead people to value their health more positively, a phenomenon called response shift.

Frequency of complaints
Fatigue, depression and anxiety are often the main complaints for cancer survivors. In a Korean study amongst 1933 survivors of breast cancer, 43% were found to have complaints of fatigue and 22% had both complaints of fatigue and depression. The fatigue was more severe with younger women (<50 years: OR 1.3; 95% CI 1.0-1.7) and with working women (OR 1.6; 95% CI 1.2-2.0)[133]. Survivors of Hodgkin's disease indicated complaints of fatigue in 24% (men) to 27% (women) of cases[150]. In an American cross-sectional study amongst patients in follow-up for different types of cancer, 32% had a depression score above the recommended cut-off point of 16. The physical health-related quality of life (HRQOL according to SF-12) was 42.8. This is within one standard deviation of the score in the general population. The physical quality of life experienced was reasonably good[196]. In a prospective study amongst survivors of breast cancer, 50% were found to have a depression and/or anxiety in the first year after diagnosis[26].

Course of complaints
The symptoms of anxiety and depression decreased in the first year after diagnosis. After the second year, 25% of cancer survivors still had these complaints. Five years after diagnosis, there was a further reduction in the frequency of complaints to 15% of patients[26]. Another prospective study also reported a reduction in symptoms of depression after the first year in elderly patients with cancer, but the wellbeing experienced did not improve in this period[244].

Noticeable differences are found in literature on the long-term effects of cancer treatment in the different diagnosis groups. In an American study with long-term survivors of breast cancer, an excellent physical, psychological and social quality of life was found after an average of 6.3 years of follow-up. Exceptions to this were the patients undergoing systemic adjuvant chemotherapy. The different aspects of the quality of life appeared to be worse for this group (p=0.03)[86].

In a study amongst survivors of Hodgkin's disease, approximately 30% were found to have chronic fatigue on average 15 years after treatment. Of these 70 patients with chronic fatigue at the first measuring point, half recovered in the 8 years up to the 2nd measurement point, while the other half continued to experience chronic fatigue. Persistent chronic fatigue appeared to correlate with the presence of B symptoms; fever, night sweats and weight loss (OR 1.6; 95% CI 1.0-2.4)[108].

**Conclusions:**
It is plausible that it is three times more common for cancer survivors to have a poorer health status and twice as common for them to experience psychological problems than their peers.
Level 2: A2 Hewitt 2003[106]

The evaluation of the general health by survivors of breast cancer varies, but the mental health is consistently evaluated as less.
Level 2: B Peuckmann 2007[203], Paskett 2008[197]

Complaints of fatigue do not appear to be more common with survivors of breast cancer, but the level of fatigue and accompanying psychological complaints seem to be more serious than experienced by peers from the general population.
Level 3: B Bower 2000[20]

Fatigue appears to be experienced by more than half the cancer patients, either separately or in combination with depression.
Level 3: B Kim 2008[133]

Approximately a quarter of survivors of Hodgkin's disease seem to have complaints of fatigue.
Level 3: B Loge 1999[150]

Depression appears to occur in 30-50% of cancer survivors.
Level 2: B Parker 2003[196], Burgess 2005[26]

It is plausible that depression decreases in cancer survivors after the first year following diagnosis, but a small group of survivors (± 15%) continue to experience complaints of depression after five years.
Level 2: B Burgess 2005[26], Stommel 2004[244]

Chronic fatigue appears to persist with a proportion of patients with Hodgkin's disease (>10-15 years), especially patients with systemic B symptoms: fever, night sweats and weight loss.
Level 3: B Hjermstad 2005[108]

The quality of life with long-term survivors of breast cancers appears to be good. Exceptions are patients treated with systemic adjuvant chemotherapy.
Level 3: B Ganz 2002[86]

**Considerations:**
Introduction
As a result of improvements in diagnostics and the treatment of cancer, the number of patients being cured and the number of long-term survivors (>5 years after diagnosis) are growing. Many of the long-term survivors of cancer are in good health. During the initial stages of developing the multidisciplinary cancer treatment, much attention was given and research conducted on the direct and often severe side effects of the treatment, such as vomiting, nausea, infections and neuropathy. Many of these side effects were found to be temporary. In the last two decades however, it has also become clear that aside from these direct side effects there are also long-term side effects and late effects of cancer treatment. As a result, a number of long-term survivors of cancer treatment pay a substantial price, because the quality of life is not optimal due to these side effects. This has lead to international attention in recent years by patients and healthcare professionals for the long-term effects and late side effects of cancer treatment. However, the attention is so recent that the precise prevalence, incidence, relative risk, pathophysiological mechanisms and genetic basis of long-term and late effects of treatment are not well known for most forms of cancer.

In answering the question as to which complaints occur after completion of cancer treatment with curative intent, there is particular interest in complaints commonly experienced by patients, independent of the type of cancer. Examples are fatigue, reduction in mobility, fear and depression. These complaints, which often occur immediately after treatment but may also occur quite some time later, have a negative effect on quality of life.
The number of long-term survivors after cancer treatment is expected to steadily increase over the coming years. The justified optimism in relation to the success of cancer treatment will be dimmed however, when it appears that the quality of life of a large proportion of the long-term survivors is less than expected and certainly less than was hoped. Physical curation only is no longer sufficient for patients, the eventual aim of every medical treatment is an existence without complaints and a return to a normal role in society. It is expected that the demands and needs of cancer patients for effective rehabilitation after disabling treatments will therefore increase.

There may be a risk of disregard by healthcare professionals for the long-term and late effects of cancer treatment. After all, the technical aim of treatment has been reached with long-term survival. Professional attention for effective rehabilitation is required to avoid cancer becoming a chronic disorder for too many patients. It is clear from literature research that the late effects have physical and psychosocial aspects. A multidisciplinary approach is therefore required in the rehabilitation of cancer patients.

There are two considerations of importance for optimal interpretation of the literature.
The first consideration concerns the overrepresentation of studies with patients after treatment of breast

cancer. Six of the twelve articles selected within the framework of the complaints after completion of treatment only relate to breast cancer. Studies concerning long-term complaints with other forms of cancer are largely still limited and have been conducted in smaller populations. From these limited studies there does not appear to be a fundamental difference in nature and frequency of long-term and late effects of treatment of breast cancer compared to other forms of cancer. For the time being however, care should be taken when results from literature on breast cancer are used to generalise for all areas of cancer.
The second consideration concerns the fact that these results are for a particular moment in time. Over time, treatment has become more goal-oriented and precise. An example of this is the sentinel node procedure in the treatment of breast cancer. There is a justified expectation that such developments will have a positive influence on the long-term and late effects of cancer treatment. These developments are of course not yet visible in current literature reviews. A similar trend occurred with cardiovascular diseases and pulmonary diseases; the clinical relevance of a reduction in chronic complaints and rehabilitation was also of great importance here. It seems an obvious choice to make use of existing experience in these areas.

# Palliative phase

**Recommendations:**
**Recommendations**
With patients in the palliative phase, it is recommended that symptoms such as pain, fatigue, lack of energy, weakness and general quality of life are measured carefully, analysed, monitored systematically and followed up.

The choice of measuring instruments in the palliative phase must be based, on the one hand, on the feasibility of systematic long-term use, and on the other hand, psychometric characteristics, in relation to the constantly changing situation as a result of interventions and/or the progressive disease.

**Literature review:**
Introduction
The palliative phase was considered as the terminal phase for decades, corresponding to approximately the last three months before an expected death. Therefore little attention was paid to research and development in palliative care. In 2003 Lynn and Adamson presented a new care model (Figure 1), and since then the palliative care refers more and more to a challenging phase in which balanced treatment and care has to be taken seriously[155].

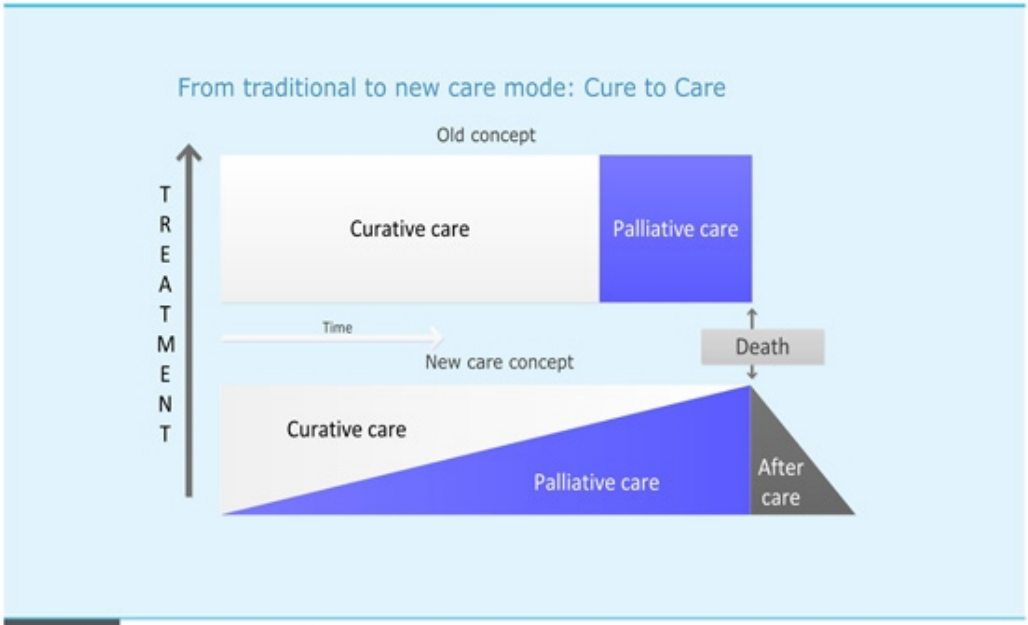



Figure 1 Care model

In the palliative phase differences can be made regarding both survivaltime and quality of life. An increasing number of questions related to the transition of care with curative intent to palliative care arose and it remains difficult to define this transition. Integrated improvements in diagnostics and symptom treatment, show possibilities for a longer (complications free) survival for advanced cancer patients than before. Palliative care emancipated as a domain for research and development.

The palliative phase has been described increasingly better in recent years and three stages can be distinguished:

1. disease palliation with the aim of reducing the disease (outcome measures are survivaltime and quality of life)
2. symptom palliation with the aim of prevention and treatment of symptoms (outcome measure is quality of life), also called the stable phase and
3. terminal palliation with the aim of a dignified dying process at a desired location (outcome measures are quality of life and quality of dying)

The spectrum of palliative care is displayed in a model-based form in Figure 2[280].

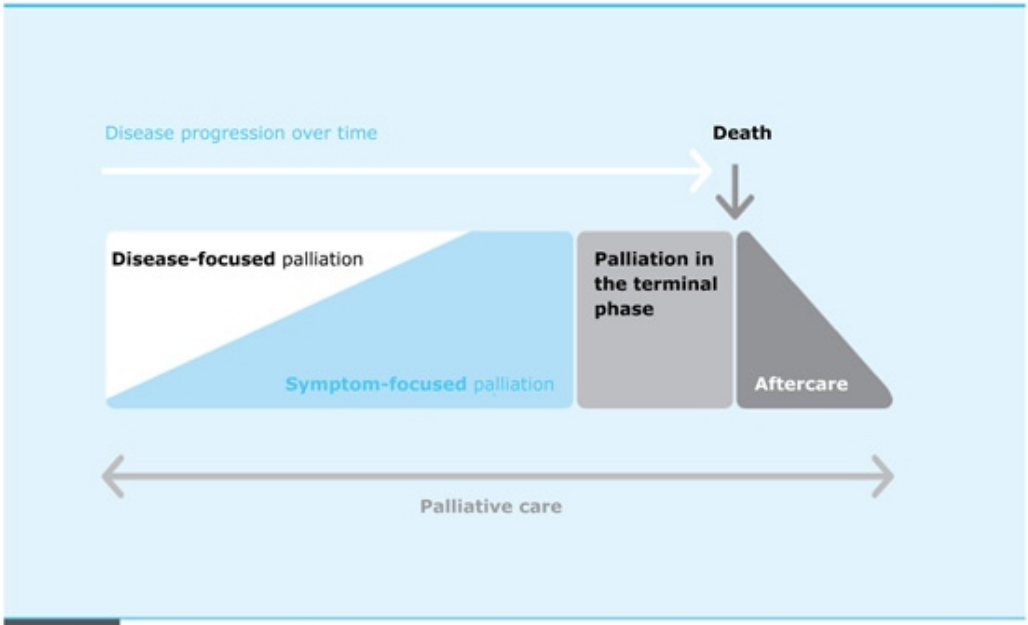



Figure 2 The spectrum of palliative care

The World Health Organisation (WHO) gave the following definition of palliative care in 2002: ‘Palliative care is an approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual'[293].

Due to the manifest wish of patients to maintain autonomy and control over their own remaining life, this guideline has incorporated the question as to which principles of rehabilitation are applicable in the palliative phase.

As clinical question, it was decided to review the prevalence of symptoms that are most common in the stage of disease- and symptom-palliation. Subsequently interventions that have already been developed (and are still to be developed) have been studied (see the chapter on rehabilitation programmes in the palliative phase). Literature concerning symptomburden in the terminal phase has been excluded.

Prevalence of symptomburden in the disease-focused palliative phase

No reviews were found in relation to symptom prevalence in the disease-focused palliative phase. However, three separate studies were found about this topic (see evidence table number 2): patients with palliative anti-tumour therapy at an outpatient clinic[209], patients receiving palliative radiotherapy[23] and patients with palliative anti-tumour therapy at an outpatient clinic[258]. The prevalence of the number of symptoms in these studies varied greatly (see Table 1). The most common symptoms were pain (37-78%), and three energy-related symptoms, namely ‘feeling weak' (31%), ‘fatigue' (37-92%) and ‘the need to rest' (43%).

**Table 1: Prevalence of symptoms in the disease-focused palliative phase (% patients in the study)**

| Symptom | Puts 2004 n = 155 (%) | Bradley 2005 n = 1296 (%) | Van den Beuken 2009 n = 571 (%) |
|---|---|---|---|
| Pain | 37 | 78 | 56 |
| Fatigue | 37 | 92 | 45 |
| The need to rest | | | 43 |
| Weakness | | | 31 |
| Sleeping problems | 34 | | 30 |
| Dyspnoea | 16 | 67 | 22 |

| | | | |
|---|---|---|---|
| Lack of appetite | 28 | 76 | 18 |
| Nausea | 22 | 46 | 14 |
| Vomiting | | | 6 |
| Constipation | 35 | | 15 |
| Diarrhoea | | | 6 |
| Dry mouth | 26 | | 28 |
| Dizziness | | 80 | 13 |
| Concentration problems | | | 20 |
| Tenseness | 24 | | 24 |
| Worrying | | | 38 |
| Easily irritated | | | 22 |
| Memory problems | | | 16 |
| Anxiety | 20 | 79 | 19 |
| Depression | | 71 | 19 |
| Restlessness | 26 | | |
| Thirst | 24 | | |
| Coughing | 17 | | |
| Itch | 12 | | |
| Financial problems | 11 | | |
| Bedsores/wounds | 8 | | |
| Painfull mouth | 7 | | |
| Sexual problems | 7 | | |
| Problems urinating | 5 | | |
| Problems swallowing | 3 | | |

Prevalence of symptoms in the symptom-oriented palliative phase

Three systematic reviews were found that reported on symptom prevalence in the symptom-focused palliative phase. The prevalence varied greatly for most symptoms (see Table 2). Solano*et al.* compared the prevalence of symptoms in patients with an advanced stage of five different chronic diseases, including cancer. A depressive disorder and/or a depression in narrower terms was common with all chronic diseases. Regarding the maximum prevalence, depression occurred in 77% of cancer patients and varied from 36 to 82% within other included diseases. Constipation (max. prevalence of 65%) and anorexia, referring to > 10% weight loss (max. prevalence 92%, reported in the table as a lack of appetite), were specifically common in cancer patients[237].

Teunissen et al. applied statistical pooling and presented prevalence figures with 95% confidence intervals. On the basis of their analysis, pain (71%; 95% CI 67-74%), lack of energy (69%; 95% CI 57-79%), weakness (60%; 95% CI 51-68%)and reduced appetit (53%; 95% CI 48-59%) were found to occur in more than 50% of patients with an average life expectancy of 12 weeks[151].

The review by Van den Beuken et al. concentrated on the prevalence of pain. The prevalence of pain appeared to vary in the different disease phases of cancer patients. In the symptom-focused palliative phase, 64% (95%CI 58-69%) of cancer patients experienced pain, 45% of these patients indicated the pain was moderate to severe. In patients treated with anti-tumour therapy (both with curative intent and with palliative intent), the prevalence of pain is 59% (95% CI 44-73%) and 36% of these patients describe the pain as moderate to severe[258].

**Table 2. Prevalence of symptoms in the symptom-focused palliative phase**

| **Symptom** | **Solano 2006[237] min-max %** | **Teunissen 2007b[252] % with 95% CI** | **Van den Beuken 2007[158] % with 95% CI** |
|---|---|---|---|
| Pain | 35-96% | 71%;  67-74% | 64%; 58-69% |
| Depression | 3-77% | 39%; 33-45% | |
| Anxiety | 13-79% | 30%; 17-46% | |
| Confusion | 6-93% | 16%; 12-21% | |
| Fatigue | 32-90% | 74%; 63-83% | |
| Dyspnoea | 10-70% | 35%; 30-39% | |

| | | | |
|---|---|---|---|
| Sleeping problems | 9-69% | 36%; 30-43% | |
| Nausea | 6-68% | 31%; 27-35% | |
| Constipation | 23-65% | 37%; 33-40% | |
| Diarrhoea | 3-29% | 11%; 7-16% | |
| Lack of appetite | 30-92% | 53%; 48-59% | |
| Lack of energy | | 69%; 57-79% | |
| Weakness | | 60%; 51-68% | |

Frequency of symptoms
Pain, tiredness/lack of energy and weakness are prominent symptoms with both patients in the early (disease-focused) palliative phase and patients in the stable (symptom-focused) palliative phase. There is no data or insufficient data in the reviews analysed on the intensity of these common symptoms. Most symptoms have been measured dichotomously[251]. In those studies where intensity scales have been used, measurements were different[237] [258].

Course of symptoms
Based on the analysed systematic reviews it is not possible to make a statement regarding the course of symptoms. It is noticeable that patients, both early on and somewhat later in the palliative phase, indicate a more or less similar top 3 in symptoms and that these are concentrated on the energy balance.

**Conclusions:**
Pain, fatigue, weakness, the need to rest and sleeping problems are common with cancer patients during the disease-focused palliative phase.
Level 2: B Puts 2004[209], Bradley 2005[23], A2 Van den Beuken 2009[259]

Pain, lack of energy, weakness and reduced appetite are the most important symptoms in cancer patients in the symptom-focused palliative phase.
Level 2: A2 Solano 2006[237],Teunissen 2007[252], Van den Beuken 2007[258]

**Considerations:**
It is expected that the number of patients in the palliative phase will increase in the coming years. Better possibilities for palliative chemotherapy, radiotherapy and/or secondary surgical interventions will mean an increase in the period in which disease palliation is possible. When progression-delaying treatments are exhausted, the increasingly broad scale of possibilities for symptom management will also lead to patients remaining in the stable palliative phase for a relatively long period of time before the transition to the final period takes place. Despite the gains, which can therefore be made in the areas of survivaltimeduration and quality of life, such a period will also be characterised by uncertainty and loss of functions. It is necessary during the palliative phase to carefully monitor signs and symptoms, in a way that is both feasible for the patient and measurable for the care giving professional. Measuring signs and symptoms, in a process of early detection that is collaboratively guided by the patient and the professional, can support the choice of interventions and contribute to the decision-making process at critical moments. Based on this knowledge, the systematic monitoring of these symptoms is highly recommended. A simple symptom diary in the form of a set of numeric scales can be used easily for this purpose. This enables both the prevalence and intensity to be monitored and can provide direction in the dialogue between the involved multidisciplinary team and the patient.

Experienced symptoms such as fatigue, lack of energy and weakness, justifies the possibility of applying best practices related to supportive interventions for similar symptoms during and after treatment with curative intent.

# Screening, discussion and referral

**Recommendations:**
**Key question**
Which instrument is both valid and suitable for use in the Netherlands for the screening and discussion of symptoms both during and after completion of treatment with curative intent and during the disease and symptom-oriented palliative phase ?

**Recommendations**
The consensus within the guideline development group is that the most suitable instrument for screening for and discussing symptoms, consequences and the wish for referral both during and after completion of treatment of cancer with curative intent and during the disease- and symptom-oriented palliative phase, is the instrument advised in the current version of the guideline on screening for psychological distress (see Guideline Screening for Psychological Distress).

The current version of the Guideline on Screening for Psychological Distress advises using the Distress Thermometer (de Lastmeter) as an instrument for identifying and screening and determining the need for care. The guideline advises to use the version of the Distress Thermometer for monitoring, in which patients, if they have indicated 'yes' in the event of a problem, can indicate the severity on a scale of 1-10, or to use the EORTC-QLQ-C30.

The consensus within the guideline development group is that when one or more problems and a request for professional care arise, their inter-relation and complexity should be determined prior to being able to provide information and/or to refer to the care of one or more psychosocial and/or paramedical disciplines or for interdisciplinary specialised rehabilitation.

The consensus within the guideline development group is that the following is applicable to screening , discussion and referral:

- Problems and a wish for referral should be inventoried and discussed with the patient. In doing this, it is recommended that the latest version of the Guideline on Screening for Psychological Distress is used (currently the Distress Thermometer) (Guideline Screening for Psychological Distress). Referral to one or more healthcare professionals in the psychosocial and/or paramedical disciplines is based on the specific symptoms of the patient.
- In the event of problems with functioning in multiple domains, i.e. physical, cognitive, emotional or social domains, and/or relating to role functioning and/or life orientation or if there is an increased risk of this, then the inter-relatedness and complexity of the problems should be determined. If there prove to be complex and inter-related problems and interdisciplinary treatment is necessary whereby the treatment plan requires mutual agreement, then referral to interdisciplinary specialised medical rehabilitation is indicated. If there prove to be problems in a number of domains (multiple), but that these are non-complex problems, then the guideline states that there may be an indication for a number of monodisciplinary treatments coordinated by a medical specialist/oncologist which may be given concurrently. Therefore this is not specialised medical rehabilitation.
- In the event of very extensive or severe disorders of function with permanent limitations, whereby the recovery process is expected to be prolonged or incomplete, then referral to outpatient or clinical specialised medical rehabilitation care is indicated.

**Literature review:**
**Summary of the literature**
No literature search was done as the guideline development group decided that the process of screening should be compatible with the Guideline on Screening for Psychological Distress. Therefore, the development group advises using the screening instrument that is recommended by the most current version of this guideline (see Guideline Screening for Psychological Distress).

**Conclusions:**
The recommendations from the guideline development group with reference to the indication process,

comprise, 1) Use an instrument to indicate the nature and severity of the problems and the wish to be referred, 2) Discuss this with the patient, and 3) Refer depending on needs and wishes and compatibility with the latest version of the guideline on psychological distress (see Guideline Screening for Psychological Distress).

**Considerations:**

**Introduction**

Problems in the physical, cognitive, emotional, or social domains, and/or relating to role functioning and/or life orientation are encountered in daily oncological practice. After they have been identified and discussed, these problems may lead to referral of the patient with cancer, or who has had cancer. The patient may be referred for further diagnostic tests, lifestyle advice, treatment from one or more psychosocial or paramedical healthcare professionals, or to a group for specialised medical rehabilitation.
This section describes the by the guideline group considered optimal process of referral for specialised medical cancer rehabilitation treatment. This is different from the original key question in which the focus was primarily on symptoms of fatigue (see Symptoms, current guideline). At that time, the decision to focus on fatigue was steered by the fact that it is the symptom most frequently found in patients who have, or have had, cancer [335].

This new interpretation concerns a more general and integrated whole in order to arrive at a referral to interdisciplinary oncological specialised medical rehabilitation care coordinated by a rehabilitation physician. It is a fact that there are a wide variety of problems that healthcare professionals in a certain discipline may or may not be able to treat. In the event of problems of functioning in the physical, cognitive, emotional or social domains, and/or relating to role functioning and/or life orientation, it is important to determine if these are inter-related, if physical training is indicated and if interdisciplinary agreement on the treatment plan is necessary for this. This may or may not be done in consultation with a rehabilitation physician, psychosocial healthcare professional and/or relevant paramedic, before referral to interdisciplinary oncological specialised medical rehabilitation care coordinated by a rehabilitation physician can be resorted to.

Not every patient with cancer needs specialised aftercare such as rehabilitation care. In cancer, most aftercare is self-care (see Guideline on Cancer Survivorship Care). By this we mean that many people are well able to process and reduce their experiences with cancer and its consequences with the support of people from their own social network and to ask for advice on self-help should be required. Stratification to care need and indication is important (see Figure 1) [DCS 2010][316] . The Danish Cancer Society estimates that around 70% of people with cancer are able to cope well with basic care, lifestyle advice and guidance on self-management [DCS 2010][316]. Approximately 5% require clinical or outpatient rehabilitation care (e.g. oncological spinal cord lesions or amputations due to a tumour), and 25% require monodisciplinary care or coordinated interdisciplinary specialised medical cancer rehabilitation care. On the basis of the 2011 cancer incidence of 100,600, it is estimated that 25,000 people with cancer needed care from a psychosocial and/or paramedical healthcare professional and 5,000 patients required interdisciplinary specialised medical rehabilitation care for complex problems [DCS 2010, NKR][316].
The guideline development group has decided that the process of screening should be concordant with the evidence-based Guideline on Screening for Psychological Distress (Guideline Screening for Psychological Distress) and therefore advises that the screening instrument recommended by the most recent version should be used (see Guideline Screening for Psychological Distress).
The Guideline on Screening for Psychological Distress recommends that the Distress Thermometer be used for screening and discussion. Revision of this guideline will show if the Distress Thermometer will continue to be the recommended instrument for screening and communication. For the time being, for purposes of the revision of the Guideline on Specialised Medical Rehabilitation in Oncology (previously Cancer Rehabilitation), the Distress Thermometer will continue to be the instrument for inventory.

When a request for professional care is indicated during discussion with the patient, the treating professional responsible should make an inventory of the patient's functional problems and check the extent to which they exist on the physical, cognitive, emotional or social domains and/or are related to role functioning and/or life orientation, or if there is an increased risk of this (in practice the treating professional can delegate the tasks of screening and referral to another suitable professional). If there prove to be complex and inter-related problems and interdisciplinary treatment whereby the treatment plan requires mutual agreement is necessary, then referral to coordinated interdisciplinary specialised oncological medical rehabilitation is indicated. If neither interdisciplinary coordination of the treatment plan nor

coordination by one person (e.g. rehabilitation physician) is necessary, then a referral to one or more psychosocial and/or paramedical healthcare professional is indicated.

If the connection between the various problems is unclear and the treating professional and the patient cannot arrive at a clear recommendation for referral, then the treating professional (or other professional to whom the task has been delegated) should consult with a rehabilitation physician, psychosocial worker and/or a relevant paramedic. On the basis of this consultation process, the complexity and inter-relatedness of the various problems of functioning and the direction referral should take are determined. Prior to, or following, this consultation, further inventory can take place, by means of additional investigations or validated and reliable questionnaires, for example.

If there are problems of functioning in one specific domain, physical, cognitive, emotional or social and/or related to role functioning and/or life orientation, or if the risk of these is estimated to be high, then, depending on the problems, the patient will be referred for treatment to psychosocial or paramedical healthcare professional, e.g. a physiotherapist or a psychologist.

In the event of very extensive or severe disorders of function with permanent limitations, whereby the recovery process is expected to be prolonged or incomplete, e.g. central neurological damage (spinal cord lesion, brain damage), amputation of limbs, etc. the patient will always be referred for outpatient or clinical specialised medical rehabilitation care.

On the basis of expert opinion and consensus within the guideline development group, this process has been reproduced in the decision tree ‘Specialised medical rehabilitation in oncology’.

# Predictive factors healthy lifestyle

**Recommendations:**
**Key question**
What are the characteristics of the independent adoption/maintenance of a healthy lifestyle (i.e. physically active, healthy diet, abstinence from smoking, limited alcohol intake, healthy body weight) in patients who have been treated for cancer

**Recommendations**
The consensus within the guideline development group is that a higher educational level, few physical symptoms and/or limitations resulting from oncological treatment and/or the absence of comorbidity are favourable attributes for the independent adoption and maintenance a healthy lifestyle in patients who have been treated for cancer. These characteristics can be included in the decision relating to the inclusion in, and structure of, specialised medical rehabilitation treatment or monodisciplinary paramedical/psychosocial care.

The consensus within the guideline development group is that in patients with cancer, smoking in combination with alcohol use and a lower level of education are unfavourable characteristics for stopping smoking. This group possibly needs extra monitoring and attention.

The consensus within the guideline development group is that intention, planning, identified regulated motivation, self-efficacy, ability, perceived behavioural control and social support are all predictive for the independent adoption/maintenance of physical activities in patients who have been treated for cancer. These attributes can be included in the decision relating to the inclusion in, and structure of, specialised medical rehabilitation treatment or monodisciplinary paramedical/psychosocial care.

The consensus within the guideline development group is that as part of the indication process for care, the primary treating professional (internist-oncologist, surgeon, radiotherapist, nurse, nurse specialist, physician's assistant, general practitioner and/or occupational health physician) should actively ask after the following determinants of exercise behaviour: level of education, physical symptoms and/or limitations resulting from oncological treatment, comorbidity, intention, planning, identified regulated motivation, self-efficacy, ability, perceived behaviour control and social support.

The consensus within the guideline development group is that the Physician-based Assessment and Counselling for Exercise (PACE[341]) questionnaire can be used to gain insight into the group of patients who are at high risk of insufficient exercise. Patients who are at risk of not getting enough exercise and who would be willing to be supervised, may be referred for an appropriate exercise intervention, either in the setting of specialised medical rehabilitation or elsewhere.

**Literature review:**
General description of the literature
Since 2008, 20 observational studies (20 articles) on predictive factors for the independent adoption and maintenance of a healthy lifestyle have been published [304] [305] [306] [307] [311] [314] [320] [325] [327] [328] [330] [333] [334] [328] [342] [348] [349] [350] [351] [353] [358] (see appendix 25 and appendix 26). The number of patients included in each study varied between 100 and 1349. All studies concerned patients who had been treated for cancer ('survivors') at various times in the past. Six studies only included patients with carcinoma of the breast [307] [325] [327] [328] [334] [353], five included a mix of cancer patients [305] [306] [314] [320] [358], and three only included patients with rectal carcinoma [333] [342] [348] [349]. Only one study has included any other form of cancer (Hodgkin lymphoma, carcinoma of the endometrium, prostate, bladder, kidney, and ovary). Publications with fewer than 100 patients were excluded from this overview of the literature. Randomised studies were equally excluded as their populations were generally selected in a fashion such that the results would not necessarily be applicable to the general cancer population.
Quality of the evidence
Most of the studies discussed were retrospective in design and/or cross-sectional analyses (n=16), the remaining four were of prospective longitudinal design [304] [307] [325] [327]. A major shortcoming was the limited external validity of most of the studies. In only a few studies were characteristics between the respondents and non-respondents compared (n=5). Of these five studies, only Karvinen [330] reported no significant differences in primarily demographic data. In addition, in the majority of the studies (n=16), the association

between variables was studied on the basis of cross-sectional analyses, and there was also a risk of recall bias (*error in results due to patients remembering past events differently from how they actually happened*).

Predictive factors for the independent adoption/maintenance of a healthy lifestyle

By means of cross-sectional analysis, two studies described the predictive factors for the adoption of a healthy lifestyle in general [338] [348].

Ng [338] included 511 patients who had been treated for Hodgkin lymphoma. A lower educational level (odds ratio = 3.3; 95%CI 1.64-5.56; p=0.0004) and also treatment for a recurrence of the Hodgkin lymphoma (odds ratio = 2.1; 95%CI 1.07-3.91; p=0.03) were independent predictive factors for smoking, moderate to excessive alcohol use and/or little physical activity.

In his study Soerjomataram [348] included 1349 patients who had had colorectal carcinoma. If chemotherapy had been part of the treatment, this proved to have been a significant predictive factor for overweight (odds ratio = 1.5; 95%CI 1.1-2.3) and alcohol consumption (odds ratio = 1.7; 95%CI 1.1-2.7). The authors could not find a plausible explanation for the latter association and the significance of this finding remains unclear. On comparison with men, women were less likely to smoke (odds ratio = 0.5; 95%CI 0.4-0.8), to use alcohol (odds ratio = 0.3; 95%CI 0.2-0.4) or to be overweight (odds ratio = 0.6; 95%CI 0.5-0.8). Lower social-economic class was also a predictive factor for smoking (odds ratio = 1.8; 95%CI 1.1-3.0) and overweight (odds ratio = 1.5; 95%CI 1.1-2.1).

Predictive factors for the independent adoption/maintenance of smoking cessation

Yang [358] included 493 patients who smoked at the time they were diagnosed with cancer. On enquiry into their smoking status, 26.6% had not stopped smoking. Concurrent use of alcohol was a significant predictive factor for continuing to smoke (odds ratio = 3.29; 95%CI 1.91-5.65). Treatment for recurrence (odds ratio = 0.28; 95%CI 0.12-0.70; p for trend <0.01), the diagnosis of lung cancer (odds ratio = 0.41; 95%CI 0.19-0.88) and a perceived high degree of social support (odds ratio = 0.59; 95%CI 0.37-0.96) proved to be significant predictive factors for stopping smoking.

Predictive factors for the independent adoption/maintenance of physical activity

Seventeen of the 20 studies examined factors for the independent adoption/maintenance of physical activity. In 10 of these 17 studies, a theoretical psychological model was used for the analysis [304] [305] [307] [330] [333] [334] [342] [349] [350] [351] [358]. In five of these studies [305] [333] [342] [349] [350] medical, behavioural and demographic factors were also taken into consideration. In the remaining seven studies, medical, behavioural, training and/or demographic factors were included in the analysis [306] [311] [314] [320] [325] [327] [328]. For further information on the models used (indicated in italics below) see Addendum [NB the Addendum will be added to the guideline text following the comments stage). This will comprise only a description of the models used].

In six retrospective studies (published in seven articles) variables such as those from the Theory of Planned Behaviour (TPB) were studied for their predictive value in the independent adoption/maintenance of physical activity [305] [330] [333] [349] [350] [351] [353]. In these six studies, the degree of physical activity was measured with the modified *Leisure Score Index,* obtained with the *Leisure Time Exercise Questionnaire* (a questionnaire designed to document average physical activity over a certain period of time). A large part (34% to 43%) of the variation in physical activity among patients could be explained by the components of the TPB. ‘Intention’ (individual intends to take physical exercise) was a significant independent factor in all studies and ‘planning’ (individual has made a specific plan to do this; actually not part of the TPB) was a significant independent factor in five of the six studies [305] [330] [333] [349] [351].

In two retrospective studies, the Self-Determination Theory (SDT) was used to determine the motivation for the independent adoption/maintenance of physical activity [334] [342]. Degree of physical activity was also measured by the *Leisure Score Index* and the *Leisure Time Exercise Questionnaire* in these two studies. A percentage (16% to 20%) of the variation in physical activity among patients was explained by the components of the SDT. ‘Regulation through identification’‘(motivation stemming from those norms and values that are important to an individual) was a significant independent predictive factor in both studies. In Peddle’s study [342] ‘introjected regulation’ (i.e. motivation derived from internal rewards and punishments of an individual), was a predictive factor.

In a prospective study carried out by Basen-Engquist [304], the variables of the Social-Cognitive Theory (SCT) were examined to determine if they were predictive factors for the independent adoption/maintenance of physical activity. Participants were given advice on exercise to be carried out at home. Over a period of six months following the advice given on exercise, a questionnaire was filled out every two months in the morning and the number of minutes spent exercising on that day were counted. Of the five core aspects of the SCT, ‘self-efficacy’ (faith in one’s own ability to start exercising) was the only significant predictive factor for the number of minutes spent exercising at the following bi-monthly measuring point (regression coefficient 2.88; standard error 1.34; $F = 7.56$; p=0.0069).

Brunet [307] has investigated at the relationship between *Impression Management and physical activity in* 169 women with breast cancer. ‘Impression management’ comprises two core aspects, i.e. impression

motivation (the motivation to be able to control oneself/to be able to exert influence in order to make a certain impression on others) and 'impression construction' (the motivation to take measures to make a certain impression on others). On analysis, a high degree of impression motivation proved to be a significant predictive factor for moderate to heavy physical activity (B = 50.84; standard error 20.96; = 0.25; p<0.05).
Chipperfield [311] has examined the predictive value of quality of life (Functional Assessment of Cancer Therapy-Prostate questionnaire) and anxiety and depression (Hospital Anxiety and Depression Scale questionnaire) in relation to physical activity in 356 men treated for prostate cancer. Men with a higher depression score were less likely to follow the guidelines on physical activity [odds ratio = 0.84; 95% confidence interval (CI) 0.76-0.94; p < 0.01]. Quality of life had no predictive value.
A number of studies have examined the predictive value of more general medical, behavioural and demographic factors in relation to physical activity [305] [311] [314] [320] [325] [327] [328] [333] [342] [349] [350]. The outcomes were extremely heterogeneous, in some measure due to differences among the patient populations studied in relation to prior treatment for cancer. Five studies showed a higher education to be an independent predictive factor for a higher level of physical activity.
By means of cross-sectional analysis Blaney [306] studied the inhibiting and facilitating factors of physical activity in 456 survivors of various forms of cancer. They used questionnaires and did not carry out multivariate analysis. The main facilitating factors were making the exercises enjoyable and varied, gradually increasing the intensity of the exercises and seeking to tailor the exercises to the individual. The main inhibiting factors were illness and other health problems, joint stiffness and fatigue.

**Conclusions:**
There are indications that chemotherapy is associated with overweight and alcohol use following rectal carcinoma.
Level 3: C [Soerjomataram 2012[348]]

There are indications that the male gender is a predictive factor for smoking, alcohol use and overweight following rectal carcinoma.
Level 3: C [Soerjomataram 2012[348]]

There are indications that a lower educational level and treatment for recurrence following Hodgkin lymphoma are predictive factors for smoking, alcohol use and little physical activity.
Level 3: C [Ng 2008[338]]

There are indications that alcohol use and concurrent smoking are predictive factors for continuing to smoke, while treatment for recurrence in general, the diagnosis of lung cancer and a perceived high level of social support are predictive factors for stopping smoking.
Level 3: C [Yang 2013[358]]

There are indications that the constructs of 'intention' (the intention to take physical exercise) from the Theory of Planned Behaviour (TPB), and of 'planning' (a specific plan has been made) are predictive factors for the adoption or maintenance of physical activity.
Level 3: C [Belanger 2012[305], Karvinen 2009[330], McGowan 2013[333], Stevinson 2009[350], Trinh 2012[351], Vallance 2012[353]]

There are indications that the construct 'identified regulated motivation' (motivation stemming from those norms and values that are important to an individual) from the Self-Determination Theory (SDT) is a predictive factor for the adoption or maintenance of physical activity.
Level 3: C [Milne 2008[334], Peddle 2008[342]]

There are indications that the construct 'self-efficacy' (an individual's belief in their innate ability to achieve goals) of the Social-Cognitive Theory (SCT) is a predictive factor for the adoption or maintenance of physical activity.
Level 3: C [Basen-Engquist 2013[304]]

There are indications that a higher level of education is a predictive factor for the adoption or maintenance of physical activity.
Level 3: C [Belanger 2012[305], Chipperfield 2013[311], Gjerset 2011[320], Ng 2008[338], Peddle 2008[342], Stevinson 2009[350]]

**Considerations:**

**Introduction**

Not every patient with cancer needs specialised follow-up care such as specialised medical cancer rehabilitation care or psychosocial or paramedical care. In cancer, most follow-up care is self-care. By this, we mean that many persons are well able to process their experiences with cancer with the support of people from their own social network and are also able to ask for advice on self-help should this be required. Stratification to care need and indication is important. Most of cancer patients (approximately 70%) appear to be able to manage their recovery with basic psychosocial care, e.g. psycho-education from a specialised nurse, and with advice and counselling on self-management aimed at the maintenance of a healthy lifestyle [316]. The importance of adopting and maintaining a healthy lifestyle is increasingly being recognised. Continuing to smoke after being diagnosed with cancer is associated with a poorer response to treatment, increased risk of comorbidity and death [358]. In addition, it increases the risk of secondary forms of cancer and lowers quality of life.

The literature search for predictive factors for the independent adoption/maintenance of a healthy lifestyle (physical activity, smoking, drinking etc.) for patients who have been treated for cancer was focused on identifying factors that may help the treating professional (who is responsible for indication, discussion and referral) to identify patients at high risk of not independently adopting or maintaining a healthy lifestyle.

The literature demonstrated that the variety of determinants summarised in the key question have been examined in very many different ways. This makes it difficult to answer the key question.

In as far as factors can be influenced, these may also offer an opportunity for intervention and for estimating the degree of guidance that is necessary. In this, the following considerations have been compiled on the basis of the available data.

Adoption/maintenance of physical activity

The degree to which patients are successful in maintaining the desired level of physical activity (in the Netherlands: the Dutch Standard for Healthy Moving (*Nederlandse Norm Gezond Bewegen, Fitnorm, or Combinorm*) can be partially explained by elements from a number of behavioural models. Globally, these factors can be grouped into three categories:

1. The intention (or lack thereof) to be physically active and the actual steps taken in this area (*Intention & Planning*).
2. Faith in one's own capabilities to become active and to stay active (*Perceived behavioural control, self-efficacy).*
3. Influence from the social environment *(Subjective norm, identified regulated motivation).*

There are a number of available assessment instruments for measuring the abovementioned factors. In compiling this guideline, there was no systematic research into all available assessment instruments and their psychometric characteristics. A simple aid to obtain information on the factors that are related to the initiation and maintenance of physical activity is the Physician-based Assessment and Counseling for Exercise (PACE [341]) 11-statement questionnaire in which the patient is asked to choose the statements that mostly apply to him/her from a total of 11 statements [308] [344]. The answer to the question gives an impression of the current exercise level and the intention in relation to exercise. The list is followed by questions pertaining to 'level of change' (*Transtheoretical Model of Stages of Change).* These questions are focused on intention, planning, own capabilities, perceived behavioural control and degree of social support. The list can be given to the patient as an aid to self-help, but should preferably also be discussed with the patient by the treating professional or another suitable professional to whom this task is delegated. If this shows that the patient is at high risk of not exercising enough and is happy to accept supervision, then the patient could be referred for a suitable exercise intervention, either to specialised medical rehabilitation in oncology or elsewhere.
Interventions that are aimed at improving the level of activity should not only focus on the improvement of physical conditions, such as strength and fitness, but should also explicitly focus on improving the perception of ability and behavioural control, and on variation in order to make exercise enjoyable.

The primary treating professional (internist-oncologist, surgeon, radiotherapist, nurse, nurse specialist, physician's assistant, general practitioner and/or occupational health physician) plays an important role in facilitating participation in an exercise intervention. A positive attitude and unequivocal advice from the treating professional concerning the importance of physical activity greatly contributes to promoting good

exercise behaviour (conversely, expressed doubt or a negative attitude from the treating professional may also negatively influence exercise behaviour). At check-up appointments during follow-up, discussing physical activity and determining the presence or absence of the relevant characteristics can contribute to the prompt screening of patients who are at high risk of poor exercise behaviour, and can also positively affect this behaviour.

Apart from behavioural factors, sociodemographic and medical factors also play a role. Extra focus on exercise is particularly important in patients with a lower educational level, patients with physical symptoms or limitations resulting from oncological treatment, and also if comorbidity is present.

For the promotion of a healthy lifestyle, it is recommended to make use of the generic modules in Practice Guidelines on Cancer. These include Work, Exercise, Giving up Smoking and Diet. In addition, the generic module on Self-management can be used. This module describes how the professional can promote self-management.

# Intake

**Recommendations:**
**Key question**
How should the intake prior to coordinated interdisciplinary medical specialised rehabilitation care in oncology be structured in order to determine the most suitable rehabilitation treatment for each individual patient?

**Recommendations**
The consensus within the guideline development group is that prior to coordinated interdisciplinary specialised medical rehabilitation care in oncology, a structured intake interview should be carried out by, or under the supervision of, a rehabilitation physician with expertise in the field of oncology. The following questions should be answered during a structured intake interview:

1. Is there a limitation of or a threat to the exercise capacity in relation to the desired functioning?
2. Is there an indication for treatment of fatigue (Distress Thermometer, VAS fatigue ≥ 4, in history)?
3. Does the Distress Thermometer indicate emotional problems and/or does the patient need support in the psychological/emotional areas (CES-D≥ 16 )?
4. Is there a disturbance of, or threat to, social functioning at work/in household tasks, relationships, social relationships/role in family and leisure activities compared to the situation prior to the disease?

The consensus within the guideline development group is that when the decision that a patient is suitable for specialised medical rehabilitation has been made in consultation with the patient and other healthcare professionals on the basis of the intake process described in the decision tree 'Specialised medical rehabilitation in oncology' (Appendix 35), then:

- Goals of rehabilitation should be formulated
- A type of tailored rehabilitation treatment should be chosen whereby physical activity (exercise) must be part of all stages of the specialised medical rehabilitation
- The patient should be referred to one or more specialised medical rehabilitation interventions.

The consensus within the guideline development group is that on indication, the tests and questionnaires below should be used to support the intake interview:
Endurance tolerance:

- On indication, diagnostic maximal exercise stress test with ECG and respiratory gas analysis.
- If a maximal exercise stress test is not possible, the development group advises obtaining an impression by means of the shuttle run or walking test.

Muscle strength:

- Indirect 1-repetition maximal measurement (1-RM)

Body composition:

- Body Mass Index (BMI), abdominal girth and skin fold measurement

Specific physical activities and social problems:

- Patient-Specific Complaints Symptoms Questionnaire (PSK)

Fatigue:

- Multidimensional Fatigue Index (MFI & Scoring tool).

Distress:

- Center for Epidemiologic Studies Depression Scale, for measuring depressive symptoms

- 10-item State Trait Anxiety Inventory (STAI) for measuring anxiety

Health-related quality of life:

- European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire- C30, (EORTC-QLQ-C30)

The consensus within the guideline development group is that the rehabilitation physician is responsible for maintaining frequent contact with the primary treating professional (internist-oncologist, surgeon, radiotherapist, nurse, nurse specialist, physician's assistant, general practitioner and/or occupational health physician), in order to provide information or to reach an agreement on the course and completion of the rehabilitation treatment. The rehabilitation physician with expertise in the area of oncology should advise the referring professionals on possible treatment options in case of a relapse in the long-term.

The consensus within the guideline development group is that structured interdisciplinary reporting of the treatment goals and the interventions is necessary both after the intake interview and after completion of coordinated interdisciplinary specialised medical rehabilitation care, thus enabling interdisciplinary coordination within the rehabilitation team and with the primary oncological treating professionals (internist-oncologist, surgeon, radiotherapist, nurse, nurse specialist, physician's assistant, general practitioner and/or occupational health physician).

The consensus within the guideline development group is that after coordinated interdisciplinary specialised medical rehabilitation care has been completed, the results of care should be evaluated with the patient. If necessary and desired, further treatment can be started.

**Literature review:**
**Summary of titerature**
In order to obtain an overview of what an intake interview should involve, a systematic search of the literature was carried out (see appendix 23) and appendix 24). No new evidence-based literature was found concerning how the intake interview prior to coordinated interdisciplinary specialised medical rehabilitation in oncology should be structured.

The Netherlands National Health Care Institute advises that other guidelines on rehabilitation be used (e.g. Guideline on Cardiac Rehabilitation).

The points listed below are central to the Guideline on Cardiac Rehabilitation.

1. Is there are disorder of, or a threat to, physical functioning?
2. Is there are disorder of, or a threat to, psychological functioning?
3. Is there are disorder of, or a threat to, social functioning?
4. Is there any question of risk behaviour?

The answers are subsequently linked to treatment goals and a rehabilitation treatment plan is made. The aims, the decision tree and associated interventions are formulated on the basis the Guideline on Cardiac Rehabilitation. Then, on the basis of consensus within the guideline development group, they are further refined to focus on oncology (see Considerations). The development group has decided not to limit this overview to those interventions whose effectiveness/functionality has already been demonstrated by academic research, but also to include those based on experience and expertise from daily practice.

**Conclusions:**
The consensus within the guideline development group is that the structure of the intake interview prior to coordinated, interdisciplinary, specialised medical rehabilitation care in oncology should be based on existing rehabilitation guidelines (e.g. Guideline on cardiac rehabilitation). This is in accordance with recommendations from the Netherlands National Health Care Institute.
Level 4: D Netherlands National Health Care Institute[11][409].

**Considerations:**

If there is suspicion of problems of functioning on the physical, cognitive, emotional or social domains, or problems relating to role functioning and/or meaning of life, whereby the involvement of multiple disciplines and interdisciplinary agreement on the treatment plan is desirable (coordinated interdisciplinary rehabilitation care) then the development group advises that a structured specialised medical rehabilitation intake interview should be carried out by, or under the supervision of, a rehabilitation physician with expertise in the area of oncology. The primary aim of this intake interview is to provide an answer to the question of whether there is indeed an indication for interdisciplinary specialised medical rehabilitation.

During the intake interview, extensive medical-technical diagnostic testing is not necessary, in fact this is undesirable. The diagnostic tests carried out at intake should be focused on the optimal choice for rehabilitation. On referral for intake for specialised medical oncological rehabilitation, the primary treating professional will take a number of known abnormalities or contra-indications into account, e.g. cardiotoxicity related to chemotherapy, bone metastases and risk of infection. The primary treating professional will only consider a referral if, from a medical-technical point of view, the situation is such that the patient can safely participate in specialised medical rehabilitation. In as far as it is necessary, the rehabilitation physician will order the necessary further investigations in order to answer those questions central to the intake interview.

In addition, in order to provide tailored care, the following questions should be answered at intake:

1. Is there a limitation of, or a threat to, the exercise tolerance in relation to the desired functioning?
2. Is there an indication for treatment of fatigue (Distress Thermometer, VAS fatigue ≥ 4, in history)?
3. Does the Distress Thermometer indicate emotional problems and/or does the patient need support in the psychological/emotional areas (CES-D≥ 16 )?
4. Is there a disturbance of, or threat to, social functioning at work/in household tasks, relationships, social relationships/role in family and leisure activities when compared with the situation prior to the disease?

If intake shows that there are indeed complex and multiple inter-related problems of functioning on the physical, cognitive, emotional or social domains, and/or problems relating to role functioning and/or life orientation, whereby there is a requirement for involvement of multiple disciplines and interdisciplinary agreement on the treatment plan, then there is an indication for specialised medical rehabilitation. If this is the case, then the development group has the opinion that when the decision that a patient is suitable for specialised medical rehabilitation has been made in consultation with the patient and other healthcare professionals on the basis of the intake process described in the decision tree ‘Specialised medical rehabilitation in oncology’ (Appendix 35):

- Goals of rehabilitation should be formulated.
- Tailored interdisciplinary rehabilitation treatment should be chosen.
- The patient should be referred to several disciplines for specialised medical rehabilitation interventions.

Oncological specialised medical rehabilitation can take place both during and after the completion of treatment with curative intent and during the palliative phase . The aims of intake for specialised medical rehabilitation are:

1. (At all phases of treatment) To translate the current problems of functioning on the physical, cognitive, emotional and social domains, and/or relating to role functioning and/or life orientation and the associated requirements of the patient to a treatment proposal which takes account of tumour- and treatment-specific disorders of function (temporary or permanent). This is based on a framework of assignment to appropriate specialised medical rehabilitation interventions.
2. (Prior to and during medical treatment) To estimate the level of threat of those problems of functioning on the physical, cognitive, emotional and social domains, and/or relating to role functioning and/or life orientation which are a consequence of the treatment, and to evaluate if this threat can be reduced by the initiation of coordinated interdisciplinary rehabilitation in order to allocate to appropriate specialised medical rehabilitation interventions.

The decision tree (Appendix 35) is based on the decision tree from the Guideline on Cardiac Rehabilitation NVVC 2010 [354].

During intake for specialised medical rehabilitation in oncology, the first action is to make an inventory of

the limitations that have developed during the disease or treatment, or if rehabilitation takes place during treatment, the risk of complications and or delayed or abnormal recovery. At the same time, points of intervention for improvement on the physical, cognitive, emotional or social domains, and/or relating to role functioning and/or life orientation should be identified. In addition, current social functioning and desired social functioning should be discussed with the patient. On the basis of this information and in agreement with the patient, a tailored rehabilitation plan can be developed.

The development group recommends that the tests and questionnaires below should be used to assist the intake interview. The choice of the tests and questionnaires recommended by the development group to be used during intake (on indication) was based on the clinimetric characteristics of these instruments, as described in the Effect Evaluation module, in as far as these concern the intake interview. As a higher degree of validity is necessary for the clinical decision-making process than for effect evaluation or for the managing of a training protocol, the recommendations for assessment instruments for intake do not mirror the instruments one-by-one, as stated in the Effect Evaluation module. Where necessary, the recommended assessment instruments can be supplemented by other problem- and discipline-specific assessment instruments, depending on the specific situation of the patient. An extensive description of assessment instruments for every imaginable problem does not fall within the remit of this guideline.

**General exercise tolerance:**
On indication, diagnostic maximal exercise stress test with ECG and respiratory gas analysis. A maximal exercise stress test with ECG and respiratory gas analysis may be indicated on the basis of risk of a cardiovascular event. This indication is particularly applicable to patients who will be trained with more than moderate exercise. The ACSM [Riebe 2015] [346] has developed a risk stratification which recommends a maximal exercise stress test for individuals with a moderate risk of a cardiovascular event, if the intention is to train with highly intensive exercise. In addition, oncological patients may also have the problems mentioned below. These may already be present or may only become apparent during the training. These problems may be an indication for a maximal exercise stress test:

- Excessive fatigue/weakness in relation to normal parameters or the situation before the disease/treatment, with no clear cause;
- Limited exercise tolerance with breathlessness or chest pain;
- Heart or lung complications resulting from cancer (e.g. pulmonary emboli, lung metastases).

A maximal exercise stress test with ECG with respiratory gas analysis may also be indicated if a valid measurement of maximal oxygen uptake capacity is required for clinical decision-making. The test is regarded as the gold standard for determining the maximal exercise tolerance [329] [332] [356].

Internationally accepted normal values for exercise tolerance in a healthy population are available (n=50,000) [346]. However, as VO2peak values show large variation in a healthy population, the results of exercise testing should be compared not only to reference values, but also to pre-diagnosis/ pre-treatment values of the same patient, and to the values required for functioning in work and other areas if daily life. The required oxygen uptake capacity in all types of activities is known, which enables the translation of level of fitness to activities of daily living and/or sport. See the ACSM guidelines for exercise testing and prescription for information [346] and Ainsworth [302].

Before proceeding to referral for a maximal exercise stress test it is advisable to enquire if a medical specialist has recently ordered a maximal exercise stress test with ECG and respiratory gas analysis. If so, these test results can be used. If in the presence of the abovementioned indications such a test has not been already carried out, then, depending on the local situation, the development group is of the opinion that there are two possibilities:

- The primary treating professional is asked to order this test.
- The medical specialist with expertise in the area of specialised medical rehabilitation makes the referral for a maximal exercise stress test with ECG and respiratory gas analysis.

Should there be logistical or other reasons for not running these tests, then in order to obtain a good assessment of exercise tolerance, it is the opinion of the development group that the shuttle walking test or the shuttle run test is a viable alternative for patients who do not have a high risk profile for cardiovascular events. (NVVC 2010).

**Muscle strength:**

- Indirect 1-repetition maximum measurement (1-RM)

**Body composition:**

- Body Mass Index (BMI), abdominal girth and skin fold measurement

**Specific physical activities and social problems:**

- Patient-Specific Complaints List (PSK) (not validated for oncological patients)

**Fatigue:**

- Multidimensional Fatigue Index (MFI & Scoring tool).

**Distress:**

- Center for Epidemiologic Studies Depression Scale, handbook, instructions (CES-D) for measuring depressive symptoms
- 10-item State Trait Anxiety Inventory (STAI) for measuring

**Health-related quality of life:**

- European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire- C30, (EORTC-QLQ-C30).

The rehabilitation physician works closely with the multidisciplinary oncological treatment team. Frequent contact with the primary treating professional (internist-oncologist, surgeon, radiotherapist, nurse, nurse specialist, physician's assistant, general practitioner and/or occupational health physician) is necessary in order to obtain information about oncological treatment and its consequences, to provide information and to coordinate the course and completion of rehabilitation treatment. In addition, the rehabilitation physician with expertise in the area of oncology should advise the referring professionals on possible treatment options in case of a relapse in physical/psychological/social/etc. areas of functioning over the long-term.

The consensus within the guideline development group is that after coordinated interdisciplinary specialised medical rehabilitation care has been completed, the results of care should be evaluated with the patient. If necessary and desired, further treatment can be started.

**Table 1. Goals of specialised medical rehabilitation in oncology**

| |
|---|
| **During treatment with curative intent**<br>Physical goals<br>• Stabilising/improving physical condition and level of activity<br>• Prevention or reduction of symptoms of fatigue<br><br>Optimising/sustaining desired nutritional status<br>Psychological/Social goals<br>• Achieving a new emotional balance<br>• Functional management of the disease and limitations (optimising coping)<br>• Functioning optimally in employment/household tasks<br>• Fulfilling a role in family/social relationships as optimally as possible<br>• Filling leisure time as optimally as possible<br>• Learning how to cope with new perspectives (existential coping)<br><br>**After treatment with curative intent**<br>Physical goals |

- Stabilising/improving physical condition and level of activity
- Learning to manage physical boundaries and limitations
- Stimulating and maintaining an active lifestyle

Optimising/sustaining desired nutritional status
Psychological/Social goals

- Achieving a new emotional balance
- Functional management of the disease and limitations (optimising coping)
- Functioning optimally in employment/household tasks
- Optimal resumption of a role in family/social relationships
- Optimal resumption of leisure time activities
- Gaining insight and getting to grips with factors that maintain or worsen symptoms such as fatigue
- Functional management of available energy
- Learning how to cope with new perspectives (existential coping)

**Palliative phase (disease- and symptom-oriented)**
Physical goals

- Sustaining/optimising physical functioning and associated quality of life
- Learning to manage physical limitations
- Optimising/sustaining desired nutritional status

Psychological/Social goals

- Gaining insight and getting to grips with factors that maintain or worsen symptoms such as fatigue
- Functional management of available energy
- Learning how to cope with new perspectives (existential coping)

Professionals can stimulate patients to participate in rehabilitation in a number of ways. Peer advisors and the patient's family and friends can be involved in optimising support for the patient.

Effect Evaluation
If necessary, the rehabilitation plan can be revised by means of an intermediate evaluation and consensus between treating professionals. In this case, the use of an assessment instrument such as those recommended in the section on Effect Evaluation can be used. At the end of rehabilitation, an evaluation should take place and the goals that have been achieved should be specified. At this evaluation, the patient should also be advised to continue with training or exercise at regular sports facilities. If at this time the patient still has care needs, then these should once again be reviewed and the intake and referral procedure to coordinated interdisciplinary specialised medical rehabilitation care or to monodisciplinary care should be restarted. The results of treatment, and if applicable, the new referral, will then be reported back to the referring professional.

## Decision tree cancer rehabilitation

**Literature review:**
Download here the decision tree cancer rehabilitation.

# Rehabilitation programmes

**Literature review:**
This module is divided into submodules. To view the content, click on the submodule title in the left column.

**Considerations:**
The below considerations are applicable to the description of rehabilitation programmes during and after completing curative treatment and in the palliative phase. Considerations that specifically relate to one disease phase can be found in the relevant subchapter.

Anatomical characteristics and function
The development group recommends selecting the training parameters on the ICF*) level 'anatomical characteristics and function' in such a way that at least muscle strength and muscle mass, aerobic capacity and flexibility are maintained (during treatment) or increased (after treatment) if desired/required. An assessment will need to be made for each individual patient, in consultation with the treating specialist where necessary, as to how far to deviate from the general principles of exercise physiology.

At a minimum, the Dutch Norm for Healthy Exercise (Nederlandse Norm Gezond Bewegen) should be followed as a guideline for training. For adults, the norm is half an hour of at least moderately intensive physical activity ($^3$4 METabolic equivalents (METs)) on at least five, but preferably all days of the week. For people over the age of 55, the norm is half an hour of at least moderately intensive physical activity ($^3$3 METabolic equivalents (METs)) on at least five, but preferably all days of the week. For those who are not active, with or without limitations, every bit of extra exercise is worthwhile, independent of duration, intensity, frequency or type. Others follow the Dutch Fitnorm, which is the same for young and old, and requires heavy intensive physical activity at least three times per week for a duration of at least 20 minutes. This norm is especially aimed at maintaining physical fitness (stamina, strength and coordination). The determination of training objectives and intensity as well as the form of guidance, will partly need to be determined on the basis of individual sport history, current activity level and personal goals regarding activities and participation.

Tailored healthcare
A number of considerations may give direction when providing tailored healthcare.
The efficacy of exercise interventions is dependent on the level of compliance by the patient. It is plausible that therapy compliance will be greater with greater motivation by the patient to participate in the intervention. It is therefore recommended when providing exercise advice to patients who will be treated or are being treated for cancer, to ensure the preferences and views of the patient regarding exercise are expressly considered in the advice.

Courneya et al. studied the association between elements from the theory of reasoned behaviour[80] and the preference for aerobic or strength training amongst cancer patients being treated for breast cancer[51]. The results of this study indicate that especially the patient's estimation of the positive effect of an intervention, the affective attitude (to what extent the patient expects to like a particular type of training) and the perceived efficacy (to what extent the patient expects the training to be feasible) are determinant for the level of motivation for a particular type of programme. Furthermore, the effects on quality of life were greater for participants in the strength training group who also had a preference for this type of training.

The level of fitness at the start of the intervention will play a role in the outcome measure. Due to the law of the diminishing returns of training, effects will be smaller with more motivated patients who have an intensive exercise history and more than average fitness. Age and gender partly determine the level of training effect for both strength and stamina. Age partly determines fitness on starting, sports affinity and trained specificity acquired.

A good nutritional status is a condition for achieving the desired training effect.
For concrete details of screening and nutritional interventions, please see the guideline General nutritional and dietary treatment[272].

*) ICF: International Classification of Functioning, Disability and Health

# During curative treatment

**Recommendations:**
**Key question**
How effective are rehabilitation interventions delivered during cancer treatment with curative intent on quality of life, role functioning, physical fitness, medical treatment continuation and completion and fatigue?

**Recommendations**
Consider giving advice on lifestyle to all patients undergoing cancer treatment with curative intent whereby the importance of physical activity is emphasised.

In order to limit fatigue during cancer treatment with curative intent, consider offering supervised physical exercise to all patients.

Consider offering cognitive behavioural therapy during cancer treatment with curative intent to patients who are already experiencing fatigue at diagnosis.

More research into the effectiveness of interdisciplinary and multimodal rehabilitation interventions during cancer treatment with curative intent is necessary.

**Literature review:**
**Summary of the literature**
The literature search included both studies on interdisciplinary/multimodal interventions and studies on interventions that could be applied in interdisciplinary specialised medical rehabilitation in oncology (see appendix 27) and appendix 28).

Description of the studies
The effect of interventions that could be applied in both interdisciplinary specialised medical rehabilitation and in treatment with curative intent for cancer was evaluated by means of seven systematic reviews [309] [324] [315] [319] [337] [343] [355]. Cramp 2012 [324] is an updated version of Cramp 2008 [315]. For this reason, we describe only Cramp 2012. Three of these were Cochrane reviews, i.e. Mishra [337], Cramp [324] and Galway [319].
In five of the seven systematic reviews the effects of physical training during treatment for cancer have been described [309] [324] [337] [343] [355]. In three of these the effects of physical training on quality of life are described [309] [337] [343], two describe role functioning [337] [343] and one describes physical condition [343]. All five studied the effect on fatigue [309] [324] [337] [343] [355]. Of these five systematic reviews, three included all types of cancer in their review and did not focus on a specific group, e.g. patients with breast cancer [324] [337] [355]. Two reviews focused on specific groups, i.e. patients with breast cancer and patients with haematological cancer treated with stem cell transplantation [309] [355]. The most complete review was that of Mishra [337]. This included a total of 36 studies (19 relevant to our key question) into the effects of physical training during cancer treatment on a large number of outcome measures, all published in or after 2011 [337].
In the sixth and last systematic review, the effects of individual psychosocial interventions by a trained healthcare professional (such as a nurse, psychologist, social worker, counsellor or physician) given either face-to-face or by telephone, on quality of life are described [319]. This review included 30 randomised studies with a total of 5155 participants. Nine of these studies were relevant to our key question (1249 participants) [319].

Because no systematic reviews could be found for a certain outcome measure or a supplementary measure, additional randomised studies including over 100 participants were sought (published after the stated search date of the systematic reviews). In the case of multimodal interventions studies with fewer than 100 participants were included, because as the outcome of a multimodal intervention was not described in any of the systematic reviews or in randomised studies with more than 100 participants.

This extra search resulted in a total of seven extra randomised studies. These were: one study on the effects of multimodal interventions [317], three studies on the effects of physical training [310] [318] [357], one study on a dietary intervention [345], and two studies on the effects of psychosocial interventions [303] [323].

Quality of the evidence

Five of the reviews were of good quality [324] [319] [337] [343] [355]. In general, the studies included in the reviews were at high risk of bias as it is virtually impossible to blind participants to the interventions. In addition, there was a great deal of heterogeneity in the studies due to the diverse outcome measures used, and unclear allocation concealment. ('Allocation concealment' refers to the blinding of the allocation of patients in the various study groups of an RCT. This means that the person who allocates the patients to a group at random cannot predict how this allocation will work out in order to guarantee aselect randomisation.

The seven randomised studies contained a high risk of bias [303] [310] [317] [318] [323] [345] [357]. In this case, the high risk of bias was, also caused by the impossibility of blinding participants to the interventions. Bias caused by lack of blinding has less influence on objective outcome measures. The assessors of the outcome measures were not always blinded to patient interventions. Here too, there was some question of unclear allocation concealment.

The level of evidence found should be placed in the correct context. The use of the GRADE system for the evaluation of evidence means that the quality of studies on the effect of physical and psychosocial interventions in a rehabilitation setting is quickly qualified as low or very low. This is because blinding is not completely possible in this type of study. On the basis of this criterion, high quality evidence cannot be expected either now or in the future – not even if all the other methodological requirements are sufficient.

It should also be pointed out that the majority of people who participate in studies on the effects of physical training are highly motivated. In addition, people who were randomised to the control groups often proved to be very physically active [326] [331]. This means that this type of study often includes a select group that is not representative of all patients being treated for cancer (and who thus in practice would be eligible for rehabilitation treatment), and that there is a possibility that the effect could be underestimated. It is actually the less motivated people who would reap the greatest benefit from rehabilitation interventions.

Interdisciplinary specialised medical rehabilitation interventions during treatment with curative intent
No studies on interdisciplinary rehabilitation interventions during cancer treatment with curative intent were found.

Multimodal interventions during treatment with curative intent
One study on the effect of a multimodal intervention during chemotherapy was found [317]. The intervention was focused on weight control and comprised a counselling plan based on motivational interview techniques consisting of a total of 19 telephone consultations with a dietician over a period of one year, combined with the recommendation to take a minimum of 30 minutes moderately intensive physical exercise at home. The control group received brochures with exercises and diet, both self-help interventions which are also freely available via internet. Although the intervention was multimodal in the sense that two different aspects of behaviour were addressed (diet and exercise), the intervention was not carried out by multiple disciplines.

*Quality of life (crucial outcome measure)*
Djuric [317] conducted the abovementioned randomised pilot study (n=40) and examined the effects of the multimodal intervention on quality of life. Questionnaires concerning quality of life and physical activity (among other things) were completed at baseline, and at 6 and 12 months. Quality of life (FACT-B) was measured before and after the intervention: in the group who had a telephone consultation this had an average of 104 (±SD 3) at baseline and an average of 116 (±SD 5) after 12 months, while the control group had an average of 108 (±SD 3) at baseline and an average of 116 (±SD 5) after 12 months. The authors did not make a pronouncement about potential differences between the groups. P values were not reported in the article.

*Role functioning (crucial outcome measure)*
The randomised study included did not report on the effect of its multimodal intervention on role functioning.

*Physical condition(crucial outcome measure)*
The randomised study included did not report on the effect of its multimodal intervention on physical condition.

*Persisting with medical treatment (important outcome measure)*
The randomised study included did not report on the effect of its multimodal intervention on continuation

with medical treatment.

*Fatigue (important outcome measure)*
The randomised study included did not report on the effect of its multimodal intervention on fatigue.

Physical training during cancer treatment with curative intent
Five systematic reviews containing a meta-analysis were included. Some of the studies included appeared in more than one review.

*Quality of life (crucial outcome measure)*
Nine studies in the meta-analysis of Carayol [309] reported the effect of physical training on quality of life. The meta-analysis found a moderate, but significant difference in quality of life between the intervention and the control groups in favour of the intervention group: SMD 0.34 (95% CI 0.07 to 0.62) [312]. The meta-analysis of Mishra [337] also described a higher quality of life in the physical training group compared with usual care in the control group. The positive effect of physical training on quality of life was found both at follow-up measurement less than 12 week after baseline (varying between 4 and 12 weeks) and at follow-up measurement between 12 weeks and 6 months (varying between 16 and 24 weeks) after baseline (difference in scores between the intervention and control groups was statistically significant [SMD 0.47 (95% CI 0.16 to 0.79) and SMD 1.25 (95% CI 0.03 to 2.53)], respectively. In those studies with follow-up measurements at 6 months after baseline, no difference between the intervention and control groups was found (SMD 0.14 (95% CI -0.11 tot 0.39). The third meta-analysis [343] has also shown that physical training had a positive effect on quality of life, SMD 0.41 (95% CI 0.18 tot 0.64), but does not mention the time of follow-up measurement.
In the randomised study of Chandwani [310] compared a yoga intervention in patients with phases 0 to III breast cancer (n=53) with a waiting list control group (n=54). At inclusion there was a statistically significant difference in quality of life between the two groups (p=0.01). The average general health status score on the SF-36 was statistically significantly lower (44.8) in the yoga group than in the waiting list control group (47.7). A statistically significant difference was also present at the measurements at 1 and 3 months after completion of medical treatment (p<0.05), but now in favour of the yoga intervention group. Six months after completion of medical treatment, there was no longer any significant difference.

*Role functioning (crucial outcome measure)*
In Mishra's meta-analysis [337], role functioning was an outcome measure in seven studies. The meta-analysis reported more progress in participants in the physical training group compared with the control group when the difference between 12 weeks and baseline was calculated [SMD 0.48 (95% CI 0.07 to 0.90)]. No difference was found between the physical training group and the control group upon analysis between baseline and a follow-up measurement between 2 and 6 months [SMD 0.07 (95% CI -0.46 to 0.60)]. Persoon's meta-analysis reported progress in role functioning in the physical intervention group compared with the usual care group [SMD 0.21 (95% CI -0.02 to 0.43)] [343]. In the randomised study of Chandwani [310] no difference was found in role functioning between the yoga and waiting list group.

*Physical condition(crucial outcome measure)*
Persoon [343] found a statistically significant difference between the physical training group and the usual care group concerning cardiorespiratory fitness [SMD 0.53 (95% CI 0.13 to 0.94)], muscle strength in the lower limbs [SMD 0.56 (95%CI 0.18 to 0.94)] and upper limbs [SMD 0.32 (95% CI 0.08 to 0.57)] in favour of the physical training group (6 studies in patients with haematological cancer with stem cell transplantation). A randomised study in patients with breast cancer (phase s I to III) [318] compared three groups: patients who got aerobic training on top of usual care, patients who got strength training on top of usual care and patients who got usual care during chemotherapy. $VO_2$ peak volume was measured before and after intervention: in the aerobic training group this was 25.2 (±7.2) ml/kg. min and 25.7 (±7.4) ml/kg. min, in the strength training group this was 25.5 (±6.2) ml/kg. min and 24.2 (±6.1) ml/kg.min and in the usual care group 24.8 (±6.2) ml/kg.min and 23.5 (±5.4) ml/kg.min. The authors did not make a pronouncement about potential differences between the groups. P values were not stated in the article.

*Medical treatment completion (important outcome measure)*
The randomised studies included did not report on the effect of physical training on continuation and completion of the medical treatment.

*Fatigue (important outcome measure)*
The meta-analyses of Carayol, Mishra, Persoon, Cramp and Velthuis [309] [324] [337] [343] [355] showed that

following medical treatment, people in the physical training group had fewer symptoms of fatigue than those in the group with no intervention. A subgroup analysis in Velthuis' review has shown that this effect was particularly noticeable when training interventions were done under supervision.
Wenzel and Chandwani [310] [357] reported no significant difference in fatigue between the training and control groups of patients who were undergoing treatment for cancer.

Psychosocial interventions during cancer treatment with curative intent
*Quality of life (crucial outcome measure)*
In their meta-analysis, Galway et al. [319] found no statistically significant effect on quality of life for psychosocial interventions compared with usual care. Six studies examined the effect of cognitive behavioural therapy, two studies examined the effect of counselling and one study examined the effect of psychosocial education. Where only those studies that measured quality of life using cancer-specific questionnaires were analysed, an improvement in quality of life was measured in the intervention group as compared with that in the usual care group [SMD 0.16 (95% CI 0.02 to 0.30)]. Aguado [303] found no statistically significant difference in the SF-36 general health score between the group of patients undergoing intravenous chemotherapy and having a psychological intervention and patients undergoing intravenous chemotherapy without psychological intervention (p>0.05).

*Role functioning(crucial outcome measure)*
Aguado [303] found no statistically significant difference (p>0.05) in role functioning between the group of patients undergoing intravenous chemotherapy with a psychosocial intervention and the group of patients undergoing intravenous chemotherapy without intervention.

*Physical condition(crucial outcome measure)*
The randomised studies included did not report on the effect of a psychosocial intervention on physical condition.

*Persisting medical treatment completion(important outcome measure)*
The randomised studies included did not report on the effect of a psychosocial intervention on continuation and completion of the medical treatment.

*Fatigue (important outcome measure)*
Goedendorp [323] stated that the group of patients having cognitive behavioural therapy (n=82) reported significantly less fatigue than the control group who did not receive cognitive behavioural therapy (n=81). The average difference was 5.6 (95%CI 0.69 to -10.5) fewer points on the CIS fatigue scale in favour of the cognitive behavioural therapy group.

**Conclusions:**
Interdisciplinary specialised medical rehabilitation interventions during treatment with curative intent
No studies on interdisciplinary specialised medical rehabilitation interventions during cancer treatment with curative intent were found.

Multimodal interventions[1]* during treatment with curative intent
There is very low quality evidence with regard to the effects of a multimodal intervention (comprising dietary advice and encouraging 30 minutes of physical activity a day) focused on preventing weight gain during treatment of cancer with curative intent. No effect on quality of life was shown.

The effect of multimodal interventions during cancer treatment with curative intent on role functioning was not studied in the included randomised study.

The effect of multimodal interventions during cancer treatment with curative intent on physical condition was not studied in the included randomised study.

The effect of multimodal interventions on continuation treatment completion for cancer with curative intent was not studied in the included randomised study.

The effect of multimodal interventions during cancer treatment with curative intent on fatigue was not studied in the included randomised study.

Physical interventions during cancer treatment with curative intent
There is very low quality evidence that physical interventions during cancer treatment with curative intent have a positive effect on quality of life.

There is very low quality evidence with regard to the effects of physical interventions on role functioning during cancer treatment with curative intent. An effect on role functioning was only shown when follow-up measurements took place within 12 weeks of baseline.

There is very low quality evidence that physical interventions during cancer treatment with curative intent have a positive effect on physical fitness (cardiorespiratory fitness, muscle strength in the upper and lower limbs).

The effect on continuation and completion of medical treatment by physical interventions during cancer treatment with curative intent was not studied in the included randomised studies.

There is low to very low quality evidence that physical interventions during cancer treatment with curative intent have a positive effect on fatigue.

Psychosocial interventions during cancer treatment with curative intent
There is low quality evidence with regard to the effects of individual psychosocial interventions delivered by a trained healthcare professional during cancer treatment with curative intent. In general, no effect on quality of life was shown. When quality of life was measured by means of cancer-specific questionnaires, this effect was shown.

There is low quality evidence that individual psychosocial interventions delivered by a trained healthcare professional during cancer treatment with curative intent do not have any demonstrable effect on role functioning.

The effect of psychosocial interventions delivered individually by a trained healthcare professional during cancer treatment with curative intent on physical fitness was not studied in the included studies.

The effect of psychosocial interventions delivered individually by a trained healthcare professional during cancer treatment with curative intent on medical treatment completion was not studied in the included studies.

There is very low quality evidence that a psychological intervention (cognitive behavioural therapy) during cancer treatment with curative intent has a positive effect on fatigue.

The general quality of evidence concerning multimodal interventions during cancer treatment with curative intent is very low.

The general quality of evidence concerning physical interventions during cancer treatment with curative intent is very low.

The general quality of evidence concerning psychosocial interventions during cancer treatment with curative intent is very low.

[1] A multimodal intervention is an intervention that targets two modalities (in this case diet and exercise), but which is not necessarily offered by multiple disciplines and thus is not by definition interdisciplinary. In this study, the complete intervention was delivered by a dietician.

**Considerations:**
**Introduction**
The Netherlands National Health Care Institute recommends that specialised medical rehabilitation in oncology should be part of the total diagnosis-treatment-follow-up care trajectory. The most appropriate intervention should be decided upon per phase and per patient. In order to be able to make a pronouncement on which intervention is the most appropriate for a patient during treatment of cancer with curative intent, a literature study has been carried out. Firstly, to establish the general effectiveness of

specialised medical rehabilitation at this phase of the disease trajectory, and also to gain insight into the effectiveness of interventions that can be applied as part of specialised medical rehabilitation treatment, such as exercise, dietary and psychological/psychosocial interventions. The literature search was limited to studies including the following outcome measures: quality of life, role functioning, physical fitness, medical treatment continuation and completion and fatigue.

On the basis of the literature selected for this guideline it is not possible to make a pronouncement on the effectiveness of interdisciplinary specialised medical rehabilitation during planned curative treatment. The results of interdisciplinary specialised medical rehabilitation as applied to target groups found in other studies (e.g. cardiac or pulmonary rehabilitation) cannot be generalised to the specific group for which this guideline is intended. As stated earlier, this guideline module concerns interdisciplinary specialised medical rehabilitation during active oncology treatment where the adverse effects of the treatment may also cause or worsen symptoms.

As a consequence of the scarcity of studies on interdisciplinary specialised medical rehabilitation as defined in this guideline, the recommendations are based on indirect evidence. We examined the effectiveness of various types of interventions (uni- and multimodal), which could be offered as part of specialised medical rehabilitation during treatment of cancer with curative intent insofar as they are described in the included studies. The quality of evidence of many of these interventions was classified as low to very low. This is largely attributable to methodological shortcomings which are difficult or impossible to eliminate from studies on behavioural interventions, such as lack of blinding of patients and/or of the providers of the intervention.

Only one study that has investigated a multimodal intervention was found. This was a very specific intervention aimed at weight control and the number of participants was low (n=40) [317]. Due to the low level of evidence on the basis of a single study, no conclusions can be drawn on the effectiveness of multimodal specialised medical rehabilitation during planned curative treatment.

The results of studies into exercise interventions and psychosocial interventions are largely consistent (see explanation in next paragraph). This strengthens confidence in the validity of the effects we found, despite the methodological shortcomings of the studies. Furthermore, in a number of cases the effect found is biologically plausible (e.g. exercise and physical fitness, nutritional status and several health conditions) in previously demonstrated dose-response relationships (exercise for the outcomes physical fitness and quality of life), which supports a causal relationship between intervention and outcome.

**Balance between desired and undesired effects**

Exercise interventions
In general, exercise interventions during treatment for cancer result in improvements in general quality of life (critical outcome measure). For the most part, the effects of the interventions in the studies included are, however, small to moderate and only partially clinically relevant. In addition, the differences in quality of life in the studies were only present in the short-term, and for no more than six months.
It should be noted that in the studies most exercise interventions during treatment for cancer are strongly focused on maintaining physical functions (capacity) and not on the carrying out of specific skills and actions that participants need for their everyday activities (performance). In every day rehabilitation practice there is a strong emphasis on the latter (see ‘Tailored Care’). In addition, most instruments for measuring quality of life are of a generic character, meaning they are less sensitive to the specific effects exercise interventions are intended to achieve.
Exercise interventions have scarcely any negative side effects, excluding the cost aspect (both to patient and society) and the time investment (for the patient). Taking into account the benefits of physical exercise on other specific outcome measures (which may or may not be relevant to this guideline), and on general health, in most cases the benefits of exercise interventions will outweigh the disadvantages.
No studies complying with the inclusion criteria were found that evaluated continuing with medical treatment. Only Courneya [313] carried out a secondary analysis of an RCT and found that patients with breast cancer who followed a training intervention reached a larger relative dose intensity of adjuvant chemotherapy than patients who did not follow this training intervention.
On the basis of the literature included, as there are no direct comparisons, few recommendations can be made concerning the form and contents of the training. Only in Velthuis’ review the results of an indirect comparison have been presented: the effects on fatigue of supervised vs. home-based interventions and between aerobic and strength training. They observed that aerobic training under supervision had a greater

effect on fatigue than strength training under supervision or home-based training without direct supervision [355].
In the 2010 “American College of Sports Medicine Roundtable on Exercise Guidelines for Cancer Survivors” the American College of Sports Medicine concluded that physical training can safely be given at all phases of treatment to patients with cancer [347]. In addition, in most cases guidelines on physical activity in the general population can be adhered to. These guidelines comprise both aerobic and strength training. However, based on tumour- and treatment-specific characteristics there are some key points that make adaptation of the training programme necessary. The consensus within the guideline development group is that in the setting of interdisciplinary specialised medical rehabilitation in oncology, the training programme should be as compatible as possible with the specific, individual goals that are set for an individual participant taking into account the capacities and preferences.

Psychosocial interventions
Psychosocial interventions are non-pharmacological interventions in which there is an interpersonal relationship between patient, or group of patients, and one or more trained service providers (usually professionals). The psychosocial aspect comprises interventions described as psychological, psychotherapeutic, psycho-educational or psychosocial [319].
The quality of the available evidence on psychosocial interventions is somewhat better than that of studies on exercise interventions. However, the effects of psychosocial interventions on the general health-related quality of life are smaller and often not statistically significant in individual studies (although they are in meta-analyses). On interpreting the results of studies on psychosocial interventions, it should be taken into consideration that in many cases the intervention is allotted to all patients in the trial, and not according to patient needs. This means that a proportion of the patients who underwent a psychosocial intervention did not need it, and that a proportion of the control patients who did not undergo intervention had a good outcome. This means that the outcome may be underestimated. It emerged from a systematic review of psychosocial interventions for fatigue [321] that psychosocial interventions appeared to be particularly promising if they had been specifically developed for the reduction of fatigue during treatment (such as fatigue-focused psycho-education or coping techniques). In a number of patients with cancer, fatigue is already present before the start of treatment. The existence of severe fatigue a year after completion of treatment can largely be explained by the pre-existing fatigue at the start of therapy. In addition, many of the chronic symptoms of fatigue after cancer can be explained by cognitive behavioural components such as a sleep-wake rhythm disorder and catastrophizing [322]. A cognitive behavioural approach is, therefore, probably most effective in patients who are already severely fatigued at the time of diagnosis.

Dietary interventions.
On the basis of the studies concerning dietary intervention during treatment, no generally applicable conclusions can be drawn about the effect on quality of life. However, from a medical point of view there is no doubt whatsoever that deterioration in nutritional status during treatment must be prevented as far as is possible. Whatever the findings of the literature search for these guidelines, active screening of deteriorating nutritional status and tailored dietary advice must be recommended. See Guideline on General Nutritional and Dietary Treatment (richtlijn Algemene voedings- en dieetbehandeling).

**Tailored care**
Rehabilitation interventions that have been evaluated by scientific research are generally uniform within a study; every patient is offered the same intervention. This ‘one size fits all’ approach is inconsistent with daily practice, where both the choice of intervention and the exact content of the intervention should be tailored to the specific needs of individual patients. In this, it is necessary to take into account patient typology-based factors, such as coping strategy, need for information and behavioural control.

**The patient’s perspective**
Daily practice shows that there is great diversity in the attitudes of patients concerning inclusion in rehabilitation interventions during treatment.
Reasons for participating in rehabilitation interventions include:

- the wish to contribute something positive to the treatment oneself
- the hope to feel better
- the wish for contact with fellow patients.

Reasons for not participating in interdisciplinary specialised medical rehabilitation interventions include:

- lack of time or perceived capacity to participate actively during rehabilitation
- long journey time to rehabilitation centre
- cost of transport to rehabilitation centre
- out of pocket expenses to rehabilitation
- no space in medical treatment programme
- lack of cooperation from employer in making time available.

It should also be pointed out that patients may find it difficult to make a good assessment of their own information needs in the area of maintaining or adopting a healthy lifestyle (in the absence of knowledge about the available information) and of their self-management skills. Care providers in the health services have a professional responsibility to support their patients in making these choices.

**The professional's perspective**
As far as the guideline development group is aware, no research on this subject has been done in the Netherlands, but there is a wide diversity in the attitudes of specialists, nurses, nurse specialists, physician's assistants and general practitioners in the matter of referring patients for interdisciplinary specialised medical rehabilitation interventions during treatment. Providers of interdisciplinary specialised medical rehabilitation are generally positive but likely rather less objective.

**Resource utilisation**
On the basis of the currently available evidence, it is not yet possible to make a pronouncement about the cost effectiveness of specialised medical rehabilitation during treatment for cancer, as defined in this guideline.
There is a costing tool available for this guideline with which the total costs of modular specialised medical interdisciplinary rehabilitation can be calculated. In every case, this sum is low in comparison with the other costs associated with treatment for cancer.

**Organisation of care**
The availability of care providers for both monodisciplinary interventions and interdisciplinary specialised medical rehabilitation is currently not the limiting factor in the accessibility of care. However, the type and quality of the help available is not always clear. Currently, there are a number of projects – both completed and under development - that are focused on collecting information about the care on offer; this includes the Guide for Cancer Care Referral (Verwijsgids Kanker).

**Societal perspective**
In the Netherlands, specialised medical rehabilitation for people with cancer is reimbursed by the basic health insurance. At the time of publication of this guideline, monodisciplinary interventions are either not, or only partially, reimbursed by health insurance and then mainly from additional health insurance policies. This could be a barrier to patients of a low socio-economic status to participate in monodisciplinary interventions. In the worst case, this could act as an incentive to include patients in interdisciplinary specialised medical rehabilitation.

**Knowledge gaps**
The effectiveness of interdisciplinary specialised medical rehabilitation during planned curative oncology treatment based on the selected outcome measures is still unknown. Research has been done which compared this approach with monodisciplinary interventions.
Further research will broaden the body of evidence on uni- and multimodal supportive interventions during planned curative treatment.
In this there are a number of research priorities:

- the optimal timing and duration of rehabilitation and interventions in the setting of rehabilitation
- the optimal dosing and form of interventions
- gaining insight into the selection of patients for whom monodisciplinary or multidisciplinary interventions will be effective.

The effect of specialised medical rehabilitation and of monodisciplinary interventions that can be implemented in the context of cancer rehabilitation on continuing medical treatment should be further investigated in randomised controlled studies.
Randomised studies are needed to investigate the effect of medical specialist rehabilitation and monodisciplinary interventions implemented in the setting of recovery from cancer on survival.

# After completing curative treatment

**Recommendations:**
The guideline working group recommends a training programme of at least moderate intensity, consisting of aerobic training (walking and cycling) to improve aerobic capacity, cancer-related fatigue and role functioning.

The guideline working group recommends a training programme of at least moderate intensity, consisting of progressive resistance training, to improve muscle strength, cancer-related fatigue and role functioning.

It is important that a tailored treatment programme is determined per patient, in which the characteristics of the disease and preferences and personal goals of the patient are taken into account.

The guideline working group recommends cognitive behavioural therapy for cancer patients treated with curative intent, who are still severely fatigued a year after completing the last oncological treatment, to improve cancer-related fatigue and the functional limitations experienced.

**Literature review:**
Accountability for the literature
Of the thirteen systematic reviews incorporated in the evidence table (see evidence table number 5, Appendix 13) regarding exercise interventions programmes, six were found to be especially relevant. The remaining reviews were less relevant or of low quality. This last category was assigned level C in the evidence table, in order to distinguish the reviews that were of sufficient quality, but only received a B due to the studies included. Aside from systematic reviews, RCT's published in 2007 or later were also included (see evidence table 6).

Exercise interventions
In general, all systematic reviews had to contend with the fact that the majority of the trials included were small (most trials only had 12-60 patients), the quality of these trials was quite poor and the interventions studied furthermore varied strongly in form, intensity and timing[55]. Knols et al. found improvements in numerous physiological parameters after exercise therapy in larger trials with patients after treatment for breast cancer. However, no improvements were reported in clinically relevant outcome measures. However, in trials incorporating patients with other solid tumours that were generally of a larger size, improvements in cancer-related fatigue, anxiety, physical strength and functional well-being were reported[139]. Information on the size of the effect was not reported.

In a recent Cochrane review, Cramp et al. reported a standardised mean difference (SMD) of -0.37 (CI -0.55, -0.18) for the effect of exercise therapy on cancer-related fatigue in patients after completing anti-cancer therapy, in favour of exercise therapy[55]. However, the conclusion by Van Weert et al. in relation to the efficacy of exercise on cancer-related fatigue and role functioning was that the reported size of the effects were conflicting and small respectively. They looked closer at the type of intervention. The most common are aerobic exercise training and progressive resistance training (PRE). Aerobic training appears to have favourable effects on the aerobic capacity, cancer-related fatigue and role functioning. PRE (only or in combination with aerobic training) may also have a favourable effect on muscle strength, cancer-related fatigue and role functioning. In relation to intensity, especially moderate to high intensive training programmes seem effective in improving aerobic capacity and muscle strength. However, the findings are not consistent in relation to cancer-related fatigue and role functioning. Aerobic training (cycling or walking) appears to be effective and suitable for improvement of aerobic capacity, symptoms of fatigue and role functioning[267].

Recent RCT's also show varying results. In a trial with patients with stage I-II breast cancer, immediate exercise was compared to delayed exercise; Milne et al. reported that the quality of life increased in the period of 12 weeks that exercise therapy (aerobic + resistance training) was given, and also to a limited degree afterwards[173]. In a well-designed study amongst 108 women with localised breast cancer, exercise therapy or an exercise placebo was compared to usual care. A difference of almost 10 points was found on the FACT-G (Functional Assessment of Cancer Therapy) after 8 weeks in favour of exercise therapy, but

not with the exercise placebo. However, an effect was no longer seen after 24 weeks, aside from an improvement in complaints of depression[58]. In another study with inactive breast cancer patients, no improvement in quality of life was found after 6 months of a supervised training programme. However, an improvement was found for a few items of the FACT-B in a subset of patients with a low starting level in quality of life[29]. While there was still an improvement in quality of life with high intensity training after 1 year in a Dutch quasi-experimental study, no difference in quality of life was found between the control group and intervention group in patients with cancer who had undergone curative treatment with chemotherapy. There was however, an improvement in muscle strength and heart lung function in favour of the intervention group[63].

Psychological interventions

The assumption was made in searching for evidence that exercise and/or physical training should be part of the intervention study in order to speak of cancer rehabilitation. As a result, scientifically researched interventions within cancer care that only have a psychological component were not part of the search process. Despite this, six studies that exclusively involve psychological interventions came up during the search process. These studies have been evaluated and reported in the evidence table (see evidence table number 5), but were not included in the description and conclusions[129] [193] [190] [212] [97] [246].
Cognitive behavioural therapy is an intervention based on psychological methods. The form of cognitive behavioural therapy outlined in the guideline also contains a treatment module focused on physical activity and physical exertion.

Cognitive behavioural therapy one year after completing the last treatment

A Dutch trial has been conducted on the effect of cognitive behavioural therapy (CBT) in severely fatigued, in principle curatively treated patients with cancer. It concerns a treatment that is always started only a year after the last surgical and/or chemotherapeutic and/or radiotherapeutic treatment has been completed. The average treatment duration with this form of therapy is 12 sessions, in which treatment is focused on a gradual increase in physical activity and on factors that keep the cancer-related fatigue going, such as: processing problems, fear of recurrence, dysfunctional cognitions, irregular sleep-wake rhythm, over and underactivity and unrealistic expectations of the environment.
In this open label trial, the effect of cognitive behavioural therapy was compared to the effect on patients who were placed on a waiting list. Significant differences in cancer-related fatigue and functional limitations were observed after 6 months. Furthermore, a clinically significant improvement was observed more frequently in the CBT group in cancer-related fatigue (54% vs. 4%) and in functional limitation (50% vs. 18%) than in patients in the control group[89].

Cognitive behavioural therapy combined with physical rehabilitation 3 months after completing the last treatment

In another Dutch multicenter trial, the effect of physical rehabilitation was compared with a combination of physical rehabilitation and CBT in patients whose last anti-cancer treatment was at least 3 months ago and who also had psychological and other complaints aside from physical complaints. No differences in effect were found in stamina or quality of life[161] [162].

**Conclusions:**

It is plausible that exercise therapy after completing treatment for solid tumours improves cancer-related fatigue
Level 2: B Knols 2005[139], Cramp 2008[55]

There are indications that aerobic exercise (e.g. walking or cycling) improves aerobic capacity, symptoms of fatigue and role functioning.
Level 3: B Van Weert 2008[267]

There are indications that progressive muscle strength training (progressive resistance training (PRE)) improves muscle strength, cancer-related fatigue and role functioning.
Level 3: B Van Weert 2008[267]

There are indications that training programmes of moderate to high intensity improve muscle strength and aerobic capacity. The effect of high intensity endurance training is doubtful in relation to cancer-related fatigue and role functioning.
Level 3: B Van Weert 2008[267]

It is plausible that exercise therapy improves health-related quality of life and that the effect continues after ceasing the exercise therapy.
Level 2: B Milne 2008a[173], De Backer 2008[62]

There are indications that cognitive behavioural therapy for cancer survivors who are still severely fatigued a year after completing the last treatment, has a favourable effect on the level of cancer-related fatigue and the functional limitations experienced.
Level 3: B Gielissen 2006[89]

Addition of cognitive behavioural therapy to physical training in cancer survivors with persistent physical and psychological complaints, does not appear to provide better results in relation to stamina or quality of life.
Level 2: A2 May 2008[161], May 2009[162]

**Considerations:**
Please also see the umbrella considerations that are part of this chapter on 'Rehabilitation programmes'.

The combined conclusions from the studies outlined in the area of exercise interventions show a varied and moderate efficacy. On the basis of the literature found, a clear answer cannot be given as to which type of intervention (aimed at strength, speed, flexibility, stamina, coordination or combinations) is the best for which patient. There is also no evidence for the choice of FITT factors (Frequency, Intensity, Type and Time). Only global and non-detailed recommendations can be made on the basis of current data.

On the basis of the intervention studies evaluated, it can be determined that the differences in the efficacy of cognitive behavioural therapy most likely correspond with the phase in which the cognitive behavioural therapy is offered. The study by Gielissen et al. concerns the group of severely fatigued patients that already had the last cancer treatment a year earlier[89]. The study by May et al. concerns a group that only had the last cancer treatment 3 months previously[161]. The first group is smaller and more problematic (in relation to chronic fatigue) than the second group. The second group concerns a larger part of the population and the patients in the second group are still in a phase in which spontaneous recovery occurs. For this reason, the recommendation in relation to cognitive behavioural therapy is limited to the first group, i.e. patients who are still severely fatigued a year after completing the last cancer treatment.

# Palliative phase

**Recommendations:**
**Recommendations**
It is recommended to use experiences from cancer rehabilitation gained by patients during treatment with curative intent in adjusted form for development of a rehabilitation programme for advanced cancer patients (disease- and symptom-oriented palliative phase). One can also strive for a standard of fitness or vitality for patients in the palliative phase.
It is recommended that the personal goals and preferences of the patient (and their family) should be central in a palliative care rehabilitation programme. In doing so, one can strive to prevent and treat symptoms on the one hand, and optimise the quality of life on the other. As part of this, it may also be essential for patients and their families to attempt to maintain physical functions, such as climbing stairs.

The guideline working group recommends that institutions make every effort for a combined offering of individual and group activities if they wish to offer rehabilitation in the early (disease- and symptom-focused) palliative phase.

For patients that gradually 'fall out of the programme' during a rehabilitation programme as a result of progressive illness, it is recommended facilitate a more limited version of the programme at home, in order to benefit from the effects of what is still possible (empowerment) in the terminal phase.

Concerning rehabilitation programmes for advanced cancer patients, the guideline working group recommends the use of a patient one-page symptom diary and a weekly evaluation of the treatment plan

by multidisciplinary healthcare providers.

It is recommended to use best practices and good examples to ascertain, analyse, follow-up and evaluate physical goals, symptoms and health related quality of life with cancer rehabilitation in the palliative phase.

**Literature review:**

Introduction

Maintaining vitality through prevention and/or reduction in signs and symptoms is one of the most urgent tasks occupying patients, family members and professionals in the palliative phase. The fear of loss of functions on the one hand, and loss of control on the other, is huge in this phase. Pain, cancer-related fatigue, weakness, the need to rest and sleeping problems are common in cancer patients, during the phase in which disease palliation and symptom palliation go hand in hand[209 23 258 252]. During the period in which palliation of symptoms is the most important goal, pain, lack of energy, weakness and reduced appetite become increasingly prominent. It is therefore recommended to perform systematic screening, registration and monitoring of signs and symptoms during the palliative phase. In doing so, it is worthwhile to take new insights in the prognostic significance of symptoms for the balance of the patient's life into account. Anorexia, weight loss, cachexia, fatigue, dyspnoea, dysphagia and cognitive limitations have all been described as a possible prognostic factor. Possibilities for treating and/or supporting the prevention of these symptoms in general, and treating these symptoms or making it possible to deal with them besides, requires focused attention. Below is a description of the intervention literature for advanced cancer patients in which this guideline only focuses on the disease-oriented and symptom-oriented palliative stage (see Figure 1)[280].

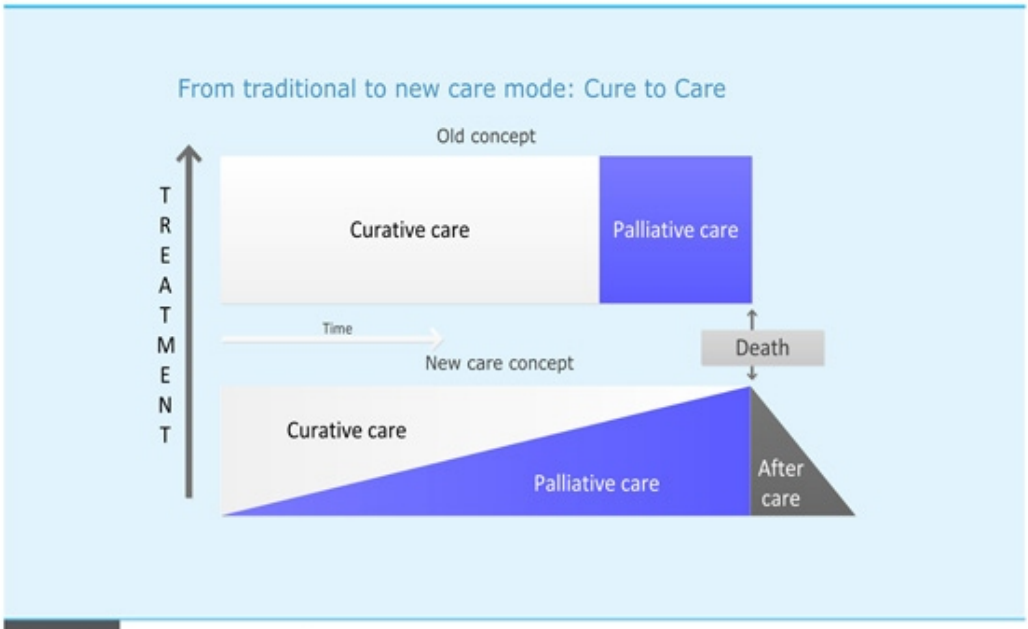



Figure 1 Care model

Accountability for selection of the literature

After systematically searching and selecting literature, 15 articles remained; the full text of these articles was studied (see evidence table 7). Only six studies [25 55 192 249 157 236] are outlined below because the relevance and/or quality of the other remaining studies is too limited within the framework of this guideline.

Interventions

Brown et al. described the results of a stratified randomised non-blinded study on the effects of a multidisciplinary intervention on cancer-related fatigue in patients with advanced cancer[25]. They selected a total of 115 patients with an indication for radiotherapy. These patients had a life expectancy of at least 6 months, but a 5-year life expectancy of less than 50%. In the intervention group, the patients participated in 8 sessions of 90 minutes exercise during a period of 8 weeks. These sessions focused on physical activity, but also on other themes such as education in the area of cognition. Each patient received a training schedule to apply at home. No specific intervention was given to the control group. Cancer-related fatigue

was measured with different instruments: Linear Analogue Assessment System (LASA), POMS, Fatigue-Inertia Subscale, Vigor-Activity Subscale, STAI and Symptom Distress Scale (SDS)) and at different moments to start directly after completing the intervention, after 4 weeks, 8 weeks and 27 weeks. No statistically significant differences were found in favour of the intervention group. However, trends were observed of less cancer-related fatigue in the control group. The intervention therefore appeared to do more harm than good.

Cramp and Daniel studied the effects of exercises on cancer-related fatigue in adults in a Cochrane systematic review[55]. A total of 28 RCT's were included in this well-conducted systematic review with a total of 2083 patients, mostly with breast cancer. In all these RCT's, an exercise programme was compared to standard care or an alternative treatment. No distinction was made in the inclusion of trials in terms of gender, age, tumour type, tumour stage and treatment. Patients following a chemotherapy regimen, as well as patients during the follow-up and patients in the palliative phase were included. Only a limited number of meta-analyses was conducted, which showed that an exercise programme had a favourable effect on cancer-related fatigue in cancer patients. The results did not distinguish between patient groups in terms of tumour stage or phase (e.g. no distinction in relation to patients in the palliative stage). These systematic reviews are therefore of limited value for this clinical question. The review reported that the results of individual studies varied. However, because individual studies were not outlined in detail in the review, a valid conclusion cannot be drawn about these individual results.

Oldervoll et al. described the effect of a physical exercise programme in patients with cancer in the palliative phase[192]. A total of 34 patients with a life expectancy of 3-12 months participated in this study. The exercise programme consisted of a 6-week programme in which exercises were performed in a group twice weekly for 50 minutes (warming up, a circuit of six stations and relaxation exercises). The exercises were aimed to obtain muscle strength, balance and resilience. The health-related quality of life of patients was determined using the EORTC-QLQ-C30, both before and after the intervention. An improvement was found in a large number of parameters, e.g. emotional functioning, cancer-related fatigue, dyspnoea, social functioning, distance walked in 6 minutes and the time required to stand up from a sitting position. As the authors themselves state however, these results will need to be confirmed in a larger comparative study.

Temel et al. outlined the results of an uncontrolled feasibility study on the effect of an exercise programme for patients with advanced non-small cell lung cancer. Forty-four percent of the 25 participants were able to complete the programme. No differences in health-related quality of life, cancer-related fatigue or mood were found[249].

In an uncontrolled study by Marciniak et al. no data on therapy compliance were reported concerning an undefined rehabilitation programme. Functional improvements were reported but these may not be related to the intervention. It is noteworthy that the presence of metastases in the heterogeneous patient group was not related to the functional outcome[157].

Sola et al. published the results of a Cochrane systematic review on the effects of non-invasive interventions on the well-being and quality of life of patients with lung cancer[236]. This well-documented review conducted a critical analysis of the results of nine studies (RCT's and clinical controlled trials (CCT's)). No pooled meta-analysis was performed. Interventions in six different domains were studied: nursing interventions in the area of breathing, nursing follow-up, nutritional interventions, psychotherapy, exercises and reflexology. Improvements in the area of general well-being and quality of life were seen especially in the domain of nursing care (interventions and follow-up). Psychotherapeutic counselling was also found to be effective, but it remains unclear in what form this should be provided. Interventions in the area of nutrition do not appear to be of benefit to the patient in the reviewed literature.

There are multiple studies, mainly uncontrolled studies, available that describe exercise programmes for patients with cancer in the palliative phase[249] [295] [157] [103]. However, significant conclusions cannot be drawn regarding the feasibility and efficacy of these exercise programmes.

**Conclusions:**
Regarding adequate feasibility and efficacy of these exercise programmes for advanced cancer patients significant conclusions cannot be drawn from the available, largely uncontrolled studies.
Level 3: C Temel 2009[249], Yoshioka 1994[296], Marciniak 1996[157]; B Headley 2004[103]

There are indications that providing an intensive exercise programme for advanced cancer patients more harm than good will be seen in outcomes regarding cancer-related fatigue.
Level 3: B Brown 2006[25]

There are indications that exercise programmes in patients with advanced non-small cell lung carcinoma can only be sustained by 44% of patients.
Level 3: C Temel 2009[249]

**Considerations:**
Please also see the umbrella considerations that are part of this chapter ('Rehabilitation programmes').

Despite the fact that no studies have been found that motivate development of palliative rehabilitation programmes, everyday practice shows that patients in the early palliative phase (stage of disease and symptom palliation) do express the need to be supported in maintaining their physical and mental strength and functions. Patients are confronted with their limited physical capabilities and the fear of losing these further in relation to their wish to maintain a certain level of quality of life. This awareness, expressed by patients to healthcare providers from different disciplines, underpins considering a standard for strength and vitality to be achieved in the early palliative phase, which may be the basis for offering palliative training over a shorter or longer period of time.

In general, palliative care patients strongly value the ability to maintain roles and functions. One aspect is the physical condition required to be able to continue to work as long as possible and/or to be able to fulfil the role in the family environment as long as possible (continue to cook for the family and eat meals with the family). In addition, development of specific resistance training programmes would appear relevant for maintaining physical functions. This is necessary to be able to use the stairs twice per day (and therefore prevent having to move the bed to the living room), use the toilet in private and continue to tie one's own shoelaces, for example. Training can also be given a more individual and symptom-focused content in the stage of symptom palliation.
Examples are:

- Support/relief during coughing fits
- Adaptation in posture to pain or fear of bone fractures
- Having the courage to continue to exert oneself in order to be able to relax for the purpose of improving night rest.

In developing palliative rehabilitation it is worth considering combining a physical module and a cognitive module, which can be offered partly on a group level and party on an individual level. The cognitive module can provide support to the presumed effect of the physical module, by learning to deal (better) with the increasing signs, symptoms and limitations. Interventions in the area of nutrition and the support of existential and spiritual questions could also form part of such a module. The application of relaxation techniques and aspects of empowerment are relevant in a combined programme of physical and cognitive activities.

These findings fit well with the aim of having patients structurally follow their own symptoms using a simply symptom diary, for example. An example of this is the format of an A4 page with numeric scales (0-10) per symptom. Signs or symptoms may refer to a physical or psychological domain and could be extended to the social or existential domain. The patient can document the presence of a symptom or problem and the associated intensity within several minutes on a weekly or daily basis. This enables patients and healthcare providers/those guiding patients to make a comparison and follow the outcome of interventions using intensity scores. If desired, target scores can be used to realize goals between the patient and healthcare providers. Providing palliative rehabilitation in such a multidimensional manner may also contribute to early detection of new problems by patients and their families on the one hand, and by healthcare providers on the other.

As yet, recommendations regarding rehabilitation of advanced cancer patients cannot be based on literature. A number of recommendations are based on expert opinions/experiences that may be considered when designing rehabilitation programmes (and associated research) for patients in the palliative phase.

# Work (re)integration and social participation

**Recommendations:**
**Recommendations**
It is important that the occupational physician and other (para)medical staff are up to date regarding the possible physical side effects and complications of cancer treatment on an organ and functional level in the short- and long-term, and are able to estimate the implications of these for the work situation.

Employing fitting interventions in a timely manner can improve medical recovery and functional recovery and facilitate the return to work.

Attention for returning to work should be a fixed component of the rehabilitation of cancer patients.

The occupational physician recommends the referral for rehabilitation in the case of a:

- Failure to return to work after some time
- Stagnation in the resumption of work
- Discrepancy between the objective and subjective load capacity
- Presence of one of the factors restricting a return to work with the emphasis on physical limitations and fatigue

The above recommendations are a selection from recommendations in the 'Blueprint Cancer and Work'; this selection has been copied in its entirety[188].

The guideline working group recommends that all professionals involved stimulate the patient to continue to exercise during treatment, within the limits of what they are capable of. A good physical condition ensures patients withstand treatment better and their course of recovery is smoother. This, in turn, facilitates the return to work.

Where necessary, the guideline working group recommends employing interventions focused on empowerment, so that patients with cancer are capable of dealing with issues in the workplace themselves.

The guideline working group recommends ascertaining the load capacity and work problems experienced by the patient with cancer. Subsequently, a tailored plan should be used to guide the patient in returning to work.

**Literature review:**
Introduction
There is an increasing insight that work, aside from being a burden, is also an important stabilising factor in people's lives and is a source of pleasure and adds meaning to people's existence. Despite this, many cancer patients encounter problems in their return to work. This is partly related to factors associated with the disease and treatment. Other demonstrable causes are insufficient attention for cancer and work within the curative sector and OHS management and the lack of communication about this with and about cancer patients. Most cancer patients receive little or no advice in relation to work or resuming work. There may also be no or insufficient support in the work environment. The inability to return to work and dependency on social benefits has a negative consequence for the quality of life of cancer patients. They miss the social contacts with and emotional support from colleagues and experience negative financial consequences of the disease.

The medical prognosis is of great importance when cancer patients return to work. A distinction must be made between patients during and after completing cancer treatment with curative intent, after which patients in general can return to work, and the group of patients in the disease-focused and symptom-focused palliative phase, for whom curation is no longer possible. Details regarding the last phase of life should largely be left up to the patient and this may include work, if desired.

An increasing number of cancer patients (want to) continue to work during the entire treatment process or, earlier than used to be the case in the past, make the transition to work. For this to be possible, there needs to be close collaboration between the general practitioner, the specialist and company physician on

the one hand, and the employee and employer on the other hand. Most patients only resume work when the treatment is behind them, and that can take 1 to 2 years. A resulting problem encountered in guiding patients back to work is the fact that current laws and regulations often force decisions to be made at a point in time in which a stable end situation has not yet been reached; this is the case with a substantial number of cancer patients with a long and complicated treatment process.

The above introduction has been copied entirely from the 'Blueprint Cancer and Work' from the NVAB (Netherlands Society of Occupational Medicine)[188].

Cancer-related fatigue and other residual complaints result in a lower quality of life, reduced functioning in activities of daily living and a reduced participation in the labour market[178]. In 2005, 22,000 people had a work disability as a result of cancer[184]. Cancer rehabilitation may help a large number of (ex-)patients with cancer deal with the effects of cancer and improve their quality of life. It is also expected that this will lead to an increase in labour and social participation.

Accountability for literature search and description
To answer the clinical question 'Which form of rehabilitation offered at which moment contributes to better work participation and social functioning for people during and after completing treatment with curative intent and in the (disease-focused and symptom-focused) palliative phase?', an extensive search has been performed using keywords for resuming work, labour participation, load capacity, reintegration, quality of life etc. (see appendix 12). Despite this, the extensive search yielded few relevant articles for a focused answer to this clinical question. For the time being, there are no studies available that provide an insight in the form of cancer rehabilitation that contributes to improved labour participation and social functioning. The guideline working group has therefore decided not to outline literature or formulate conclusions for this clinical question. The guideline working group has formulated remaining considerations however, and supported this with literature where possible.

Insight in the issues experienced by cancer patients in relation to resuming work can be found in the 'Blueprint Cancer and Work', formulated by the NVAB in 2009[188] in collaboration with the Coronel Institute, CBO and the NFK.
The 'Blueprint Cancer and Work' describes:

- Predictive factors for resuming work
- Cancer rehabilitation
- Follow-up, prevention of comorbidity and non-attendance after cancer
- Evaluation
- Recommendations for research

The background document provides the scientific foundation and accounts for the recommendations made in the blueprint[188].

For recommendations in this chapter, a selection has been made from relevant recommendations in the 'Blueprint Cancer and Work'[188]; this selection has been copied in its entirety. These have been supplemented with considerations and recommendations formulated by the guideline working group.

**Conclusions:**
See the background document for 'Blueprint Cancer and Work' for conclusions regarding predictive factors and rehabilitation for returning to the workforce[188].

**Considerations:**
**Recommendations**

Working improves health
In a report, Waddel et al. wrote: working is therapeutic, it aids recovery and rehabilitation, leads to better health, minimises damaging physical, mental and social effects of long-term absence from work, reduces the risk of long-term disability, enables full participation in society and independence, reduces poverty, and improves quality of life and well-being[278]. The report is based on a review that studied adults of working age with general health problems (mental, muscular/skeletal and cardiorespiratory problems), which are

responsible for two-thirds of absences through illness. Careful evaluation for cancer patients is therefore required. If their health status allows for it, cancer patients should be stimulated and supported in an early stage to continue to participate in the labour process and to return to work.

The most important message in a review on the health of the British population of working age states: 'Working for a healthier tomorrow'[16]. Black emphasises that a fundamental change is needed in the way of thinking about the fitness required for participation in the labour process. We must abandon the idea that it is undesirable to participate in the labour market if you are not 100% fit. Participation in the workforce is generally no impediment for recovery, but is generally good for people's health, including those with cancer.

A study on the quality of life of breast cancer survivors showed that participation in the workforce was important for this group. Participation in the workforce gave these survivors a feeling of living a normal life and helped in dealing with the negative effects of treatment[79].

Interventions focused on returning to work

Absence through illness can be seen as a treatable consequence of having cancer. Due to the social and economic consequences of absence through illness, implementing guidance aimed at re-entering the workforce should receive attention as soon as possible from a clinical approach. In an English study, Amir et al. have demonstrated that late implementation of guidance and interventions can have negative consequences for returning to work[7].

The medical prognosis is of great importance in cancer patients returning to work. It is recommended in the 'Blueprint Cancer and Work' that a distinction is made between patients during and after completing cancer treatment with curative intent, after which patients return to work, and the group of patients in the disease-focused and symptom-focused palliative phase, for whom curation is no longer possible[188]. Details regarding the last phase of life should largely be left up to the patient and this may include work, if desired. An underlying clinical problem is that the prognosis of a cancer patient may not be directly evident in the first treatment phase, and it may change substantially if, for example, metastases are found. In addition, treatments are sometimes so long that it may take years before the patient is no longer in an ongoing treatment process. This applies especially to hormone therapy and immunotherapy, which is often continued for years after the primary treatment. It should also be noted that even if the eventual prognosis for survival is unfavourable, an increasing number of patients in the disease- and symptom-focused palliative phase are partially or fully capable of fulfilling their work position for quite some time, sometimes even for many years.

However, Dutch social legislation, such as the WVP (Dutch Gatekeeping Improvement Act) and WIA (Work and Income according to Labour Capacity Act), does contain time frames independent of the course of the disease and treatment process. From this perspective, it is important to inform the patient at an early stage about the possibility of commencing integration during treatment. To enable a return to work at an earlier point in time, there needs to be close collaboration between the general practitioner, the specialist and occupational physician on the one hand, and the employee and employer on the other hand. To this end, it is of importance that the wish to do so is also assessed early in the treatment phase, in regular contact with the patient. If the patient would like to (re)integrate in the workforce and is capable of doing so, it is important that this process is guided in an expert and multidisciplinary manner. Especially because various complex and serious medical complaints may develop during treatment that require ongoing reassessment to check if the reintegration steps are medically feasible. In doing so, the importance of the clinical treatment itself (aimed at curation or remission of palliation of the effects of the disease), the reintegration (ability to continue to work) and rehabilitation (recovery treatment) must be balanced against each other. A combination of treatment and rehabilitation may lead to various logistical issues. In addition, the degree and speed of recovery, as well as treatments with negative impact on workability and malaise resulting from treatments, may affect any rehabilitation that may be initiated. Aside from knowledge of rehabilitation, the cancer rehabilitation team must therefore also possess good knowledge of the predictive factors that determine the ability of cancer patients to resume work (see the Blueprint Cancer and Work). There must be effective communication in a multidisciplinary setting and with good agreements regarding responsibilities and tasks, with the guidance provided by the company's medical staff. Occupational therapy interventions may help with practical problems that need to be resolved in maintaining the balance between complaints, work activities and activities at home.

There are an increasing number of people in the Netherlands who are working without access to a company physician, such as is the case with ZZP's (self-employed without staff). It is important for this

group that an occupational consultant who is an expert in the cancer setting in terms of clinical treatment, is able to provide supportive advice on reintegration and suitable supportive rehabilitation treatment, if required. Good experiences have been gained in a limited number of centres in the Netherlands on a pilot basis with such a consultant in policlinics, such as the policlinic ‘work and breast cancer' and the policlinic ‘people and work'. It is expected that a larger number of consultants or policlinics will become available with a more regional distribution in cancer treatment centres. However, no scientific study has been conducted on the effect of such policlinics on the reintegration and well-being of cancer patients.

The problems experienced by cancer patients are becoming increasingly similar to the problems experienced by patients in rehabilitation following other diseases, and it is therefore necessary that cancer rehabilitation is focused on similar objectives as those incorporated in other rehabilitation guidelines (e.g. heart and lung rehabilitation)[45]. While structural attention is already being given to preventing heart and lung rehabilitation patients from experiencing a work disability and being unable to work at a later point in time due to early reintegration advice within rehabilitation, this approach is still lacking in the cancer setting; aside from occasional initiatives that are not distributed nationally.

Aside from returning to work, a return to functioning in society other than work is also of importance. For example, it is important whether patients are able to function independently at home after treatment, if they are able to continue to perform voluntary work or other social activities. Suitable rehabilitation should also be offered for problems with functioning in society. For example, it may also be important that a patient receives an early recommendation for guided exercise in order to prevent the patient needing to move to a nursing home. In this manner, cancer-related fatigue and other complaints may be reduced so that the ability to function in the home situation is not hindered and care needs will not increase.

There is currently no concrete evidence available regarding interventions with cancer patients aimed at a return to the workforce. A good physical condition ensures patients withstand treatment better and their course of recovery is smoother. This, in turn, facilitates the return to work. All professionals involved can stimulate the patient to continue to exercise during treatment, within the limits of what they are capable of.

Employees with a chronic illness may benefit from interventions aimed at empowerment, with the aim that they are largely able to resolve problems in the workplace by themselves. To this end, motivational interviewing is a conversational technique that may be effective[268 269]. This concerns a directive person-centred conversation style, aimed at promoting a change in behaviour, to help clarify and resolve ambivalence in relation to change[172]. The essence of motivational interviewing is that the motivation to change comes from the person themselves rather than being imposed from outside.

For cancer patients, it is desirable that the load capacity and any issues in relation to work are detailed and a visit is made to the workplace. This means that an adequate work history should be compiled, with specific attention for work pressure, the ability to make adjustments, social support, perspective and the connection between the patient's work and private life. A tailored approach can then be taken in guiding the patient's return to work and alignment with the possibilities at that point in time. For example, advice can be provided regarding adaptation of tasks, working times, aids and the working environment so that a return to the workforce becomes or remains a possibility. This involves finding practical solutions to problems and searching for the right work possibilities that are aligned with the load capacity and environment. A gradual return to work fits the graded activity strategy. Interventions consisting of consultation and consensus between stakeholders (such as employee, employer and health & safety advisors) and work adjustments have been found to be effective in the return to work of employees absent from work due to back pain[31].

There is evidence for the efficacy of a work assistance module (based on ergotherapeutic principles) in the return to work of people suffering from depression. This seems relevant because depression is a common problem with cancer patients. A randomised study has shown that patients from both groups (control group with standard care versus experimental group with standard care and a work assistance module) recovered equally well from their depression. However, the patients from the experimental group returned to work earlier and were working more hours at the end of the study period than patients who had not received the work assistance module[69]. The study specifically looked for clinical problems in someone's work environment or more personal behavioural factors that could form an obstacle for their return to work. Patients were subsequently assisted by searching for a practical and pragmatic solution to these problems.

In summary, it can be concluded that a complex array of factors determine the return to the workforce and social participation by cancer patients. These factors are not only disease-related but also the result of the

work context, social environment and personal factors. It is therefore of importance that one does not wait until the patient requests assistance for a stagnated recovery, but that the course of recovery and reintegration are assessed in an ongoing guidance process. The rehabilitation treatment should contain adequate tailored healthcare for the specific needs and clinical problems with which the cancer patient is being confronted at that point in time. The guideling working group is therefore of the opinion that ongoing activation is desirable in all treatment phases in order to attempt to maintain a form of minimum functioning. After treatment is complete, this must focus on rebuilding activities and reintegration and participation in society.

# Measurement instruments

**Literature review:**

Introduction

Having cancer, cancer therapy and surviving cancer can be associated with physical, social and mental problems. On a physical level there may be reduced cardiovascular capacity and lung function, reduced muscle strength and muscle endurance, increased fat mass, weight changes and cancer-related fatigue. The problems on a mental level may be depression, anxiety, stress, a reduced feeling of self-worth, loss of control and reduced psychological and emotional well-being. Social problems may consist of reduced capacity to participate in the workforce and recreational activities.

Evaluation of measurement instruments

This chapter describes effect evaluation of cancer rehabilitation, i.e. the use of measurement instruments for the evaluation of effects of a rehabilitation programme with cancer patients. Measurement instruments may be used for diagnostic, prognostic and evaluation purposes. Reliability and validity is important for all purposes, but also ease of use. Ease of use concerns how simple it is to score and interpret the scores (such as the existence of normative data) and if scoring contributes to clinical decision-making by the care professional. In terms of the patient, it concerns the time taken for the measuring to be performed or to fill something in. For evaluation purposes, an instrument must also be responsive. There is no univocal answer regarding the "right" calculation of responsiveness, also called longitudinal validity or sensitivity, to change.. Both distribution and anchor-based methods are used.

One of the considerations in choosing a measurement instrument is the recall period (today, last week, last month). During cancer treatment. health status changes often (even per day) and is strongly dependent on whether patients have just had chemotherapy or not. If health status changes often, it is recommended the recall period is kept as short as possible. The drawback from deriving responsiveness from observational and experimental research, is that when no changes are observed, it is not clear if this can be attributed to the measurement instrument or because the stimulus was insufficient.

Because psychometric characteristics and responsivenessboth play a role in evaluating evidence for measurement instruments, classifying evidence is more difficult than other topics in this guideline. Psychometric characteristics and responsiveness can be considered as two more or less independent dimensions; of course one can only discuss responsiveness when an instrument is valid and reliable. The authors have used the following points of departure in classifying the evidence and selecting articles:

In relation to validation, the evidence has been classified as following (from low to high):

- Not validated
- Validated outside of the Netherlands, but not with cancer patients
- Validated outside of the Netherlands with cancer patients
- Validated in the Netherlands
- Validated in the Netherlands with cancer patients

In relation to responsiveness, classification is as follows (from low to high):

1. No data available on responsiveness
2. Responsiveness can be derived from observational research with patients not diagnosed with cancer
3. Responsiveness can be derived from observational research with cancer patients
4. Responsiveness can be derived from experimental (intervention) research with patients not diagnosed with cancer
5. Responsiveness can be derived from experimental (intervention) research with cancer patients
6. Responsiveness has been explicitly researched and determined on the basis of accepted statistical methods

The lowest and highest levels of evidence are a combination of the lowest levels in both dimensions and a combination of the highest, respectively. Between these, it is more difficult to make an explicit classification. The final choices have been made on the basis of scientific evidence, as well as on the basis of experiences in clinical practice that have been put forward by authors (with clinical expertise) of the other clinical questions. Given the problems experienced with the classification of evidence for this clinical question, it was decided neither to indicate the quality of the selected articles in the evidence table nor to

connect a level of evidence to the recommendations.

Literature search results

In the first search, 343 studies were found. Rehabilitation interventions with cancer patients were included. Lifestyle studies were excluded, namely studies in which patients received the advice to exercise at home and in which no functions such as strength and aerobic capacity were measured. Forty-eight studies remained after the selection (see evidence table number 9, Appendix 13). A systematic search was performed for RCTs in cancer rehabilitation to find suitable instruments to measure the outcomes of cancer rehabilitation. The measurement instruments found were ordered in the ICF model (see Table 1). A search was subsequently made for the psychometric characteristics of the instruments found. An extensive description of the literature searches can be found in Appendix 12.

Inventarisation of the measurement instruments used in RCTs on cancer rehabilitation fall into the following domains:

1. Health-related quality of life is an overarching domain
2. Functions and anatomical characteristics: body composition: including length/weight/body fat percentage , strength, aerobic capacity and range of motion (ROM)
3. Functions and anatomical characteristics: cancer-related fatigue (CRF), pain, sleep
4. In the area of activities, physical activities are measured using questionnaires and physical tests
5. No measurements have been found for participation level, but these are often included in physical questionnaires (sports and work)
6. Personal factors: including depression and anxiety

An inventory was subsequently made of the measurement instruments used in the selected studies and a new search was performed for psychometric characteristics (reliability, validity, responsiveness etc.). The findings of this search are outlined per subchapter:

- Measurement instruments for functions and anatomical characteristics
- Measurement instruments for physical activity
- Measurement instruments for health-related quality of life, and
- Psychological measurement instruments for psychological well-being

**Tabel 1. Overzicht meetinstrumenten uit oncologische revalidatie RCT's**

**Gezondheidsgerelateerde kwaliteit van leven**

Quality of life index for cancer patients (QOL), QLQ-C30
Rotterdam Symptom Check List (RSCL)
Quality of life: the instrument developed by Chae & Choe (2001a) on the subject of South Korean breast cancer patients domestically
SF-36 (6x)*
EORTC QLQ C30 (3x)
Satisfaction with life scale
FACT-B (5x)
FACT-G (4x)
WHOQOL-BREF
Neck Dissection Impairment Index (NDII)
FACT-P
Visual analog scale (QOL)

**Functies/anatomische eigenschappen**

% BF (skinfold) (6x)
Whole-body dual energy X-ray (6x)
BMI (2x)
Muscle strength 1RM (9x)
ROM shoulder (5x)
Lymphedema measurements (4x)
Aerobic capacity (12x)
Linear Analogue Self assessment
Height (3x)
Weight (6x)
Lean body weight (2x)
Pittsburgh Sleep Quality Index (PSQI) (2x)
Sleep measurements: Actigraph
Epworth Sleepiness Scale
Grip strength (grip dynamometer) (2x)
Flexibility (modified sit and reach) (2x)
Waist and hip circumference (3x)
Blood pressure (2x)
Heart rate (4x)
Expanded prostate cancer index composite (EPIC)
Fatigue symptom Inventory (2x)
Fatigue severity scale (FSS)
(revised) Piper Fatigue scale (6x)
POMS –fatigue
Brief Fatigue Inventory (BFI) (2x)
Schwartz Cancer Fatigue Scale (SCFS)
Fatigue VAS
Fatigue FACT-An (4x)
Brief Fatigue Index
FACIT-F (3x)
VAS pain (3x)
Bone mineral density
Diet intake (3x)

**Fysieke activiteit**

7-Day Physical Activity Log (PAL) + daily steps on a 7-day pedometer log.
The Seven-Day Physical Activity Recall (7-Day PAR)
7-day Physical Activity Questionnaire
International Physical Activity Questionnaire (IPAQ)
Godin Leisure Time Exercise Questionnaire (2x)
The Scottish Physical Activity Questionnaire (SPAQ) (3x)
Community Health Activities Model Program for Seniors
Physical Activity Questionnaire (CHAMPS)
Physical Activity Scale for the Elderly (PASE)
Weekly activity logs
2-min stairclimb
6 minute walk (2x)
12 min walk (3x)
Rockport 1-mile walk test
modified Canadian Aerobic Fitness Test (mCAFT)
modified Shuttle test 10 meter course
Borg scale / RPE (3x)
Exercise log (3x)
Stage of change for exercise ladder questionnaire (SOC)
Actigraph / accelerometer
Shoulder disability: SPADI
Sit to stand x 5
Nine Hole Peg Test of Finger Dexterity
Wingate upper extremity function questionnaire

**Participatie**

-

**Persoonlijke factoren**

Happiness: Fordyce Happiness Measure
Self-esteem: Rosenberg Self- Esteem Scale (2x)
Temporal satisfaction with Life scale Depression survey
Depression CES-D (4x)
Psychological well-being HADS
Anxiety: State-Trait Anxiety Index (STAI)

Positive and negative affect scale (PANAS) (2x)

Stress: Cohen's 10
Relationship and body image
Physical Self-Perception Profile

Satisfaction with Life Scale (SWLS)
Psychosocial adjustment, Lee (1999)
SCL-90
POMS-depression (3x)
Anxiety Rosenberg Self-Esteem Scale Inventory
Social Physique Anxiety Scale-7 items (SPAS-7)

Body Esteem Scale (2x)

Depression: Beck Depression Inventory (3x)
Adherence (2x)
Coopersmith self-esteem inventory

* *How frequently these instruments were described in the RCT's can be found in brackets after the relevant measuring instrument. See* evidence table 9.

# For functions and anatomical characteristics

**Recommendations:**
In relation to pain, the guideline working group recommends using the measurement instruments as recommended in the guideline 'Pain and cancer' [ACCC 2008]: the Visual Analogue Scale (VAS) pain scale, the Numerical Rating Scale (NRS), Verbal Rating Scale (VRS), faces scale or multidimensional scales or the pain scales of the EORTC QLQ-30 or SF/RAND-36.

Measurement of length, weight, abdominal circumference and fat percentage is recommended to measure body composition. Changes in Body Mass Index (BMI), abdominal circumference, fat percentage and percentage of weight change can be used for effect evaluation.

In relation to underweight, it is recommended to use the measuring instruments as recommended in the guideline 'General nutritional and dietary treatment'.

In the event of overweight and a large abdominal circumference, it is recommended the guideline 'Multidisciplinary Cardiovascular risk management' is followed.

It is recommended to determine the direct or indirect 1 repetition maximum (1RM) to measure muscle strength. The use of a test session and a standardised protocol is necessary for a reliable measurement.

To determine the aerobic capacity, ventilatory threshold, maximal heart rate and training intensity, it is recommended a maximal exercise test with breath-by breath-gas analysis and ECG is used. In doing so, the national and international guidelines for cardiopulmonary exercise tests should be followed.

It is recommended to use the Multidimensional Fatigue Inventory (MFI) to measure cancer-related fatigue.

**Literature review:**
Body composition: length, weight (BMI), abdominal circumference, body fat percentage
Weight gain during and after cancer treatment occurs in the form of sarcopenic obesity: weight gain caused by an increase in fat mass, while there is a simultaneous decrease in fat-free mass. There are strong indications that overweight or weight gain negatively influence prognosis. It leads to an increased risk of recurrence and to avoidable death through other causes (e.g. cardiovascular diseases, diabetes II)[254] [125]. Overweight (*Body Mass Index* (BMI) > 25) is a risk factor for cancer. The risk of overweight women for developing breast cancer is increased by 30-50% compared to women with normal weight. The risk for overweight men developing colon and rectal cancer is increased by 50 to 100%, and for women 20-50%. Finally, overweight is one of the most important risk factors for cervical cancer[145].

The World Health Organisation recommends using BMI to classify overweight (BMI 25.0 - 29.9 kg/m$^2$)[292] and obesity (BMI ≥ 30.0 kg/m$^2$). Length and weight are required to determine the BMI. In contrast, waist girth is a better predictor for the risk of death of people above 55 years. This is a measure of the amount of abdominal (visceral plus subcutaneous) fat, which provides an additional health risk aside from BMI. Women have an increased waist girth if it is > 80 cm, with men this is > 94 cm. The risk of morbidity is clearly elevated if the waist girth is > 88 cm for women and > 102 cm for men[98]. There is a role for both BMI and waist girth in the identification of cardiovascular risk factors. To this end, see the guideline 'Multidisciplinary Cardiovascular risk management'[144].

Negative changes in body composition (specifically; sarcopenic obesity, with a reduction in muscle mass and increase in body weight) can only be determined on the basis of BMI and waist circumference. This requires the fat-free mass to be determined. Dual energy X-ray absorptiometry (DEXA) is the gold standard for this. Bio-impedance and skinfold measurements are acceptable for clinical use, but are less precise. In the case of bio-impedance measurements, tetrapolar measurements are recommended above duopolar measurements[19]. The precision of skinfold measurements to calculate fat percentage is +/- 3.5% when the right technique and calculations are used[105]. Skinfold measurements are generally more valid than bio-impedance to calculate the fat percentage.

A common occurrence with cancer is a worsening in nutritional status, resulting in serious clinical depletion. There is relevant weight loss in 50-60% of patients at the time cancer is diagnosed. Undesirable serious weight loss occurs in virtually all patients with an advanced stage of cancer (see the guideline General nutritional and dietary treatment) [ACCC 2005]. A reduction in fat-free mass may result in a reduced

capacity for physical exertion and cause or worsen complaints of fatigue, in which case achieving a healthy weight and especially a healthy body composition must also be an aim of the intervention.

Muscle strength: direct or indirect one-repetition maximum (1-RM)
One-repetition maximum is defined as the maximum weight that can be lifted in a single repetition without compensatory movements. An indirect determination is recommended because the burden on the connective tissue and heart during a direct determination of the 1-RM is large. During an indirect determination, the test is conducted with a weight that allows for a maximum of 5 repetitions. The 1-RM can subsequently be estimated with the help of a regression equation. Different equations have been outlined, with similar validity[213]. The below table shows percentages for 1-RM on the basis of different formulas.

**Table 1. Percentage 1RM on the basis of different formulas**[213]

| | Bryzcki | Epley | O'Conner |
|---|---|---|---|
| **Number of repetitions** | **%1-RM** | **%1-RM** | **%1-RM** |
| 1 | 100 | 100 | 100 |
| 2 | 97,2 | 93,8 | 95,2 |
| 3 | 94,4 | 91 | 93 |
| 4 | 91,7 | 88,3 | 90,9 |
| 5 | 88,8 | 85,8 | 88,9 |

The preferred formula is the Bryzcki formula, in which 1-RM is estimated as:
1-RM = (weight used/(1.0278-(0.0278*number of repetitions)[213]. When the value obtained from this equation does not appear feasible for the patient, the Epley formula can be chosen, in which the 1-RM values are a little lower. The 1-RM must be determined separately for each muscle group.

In a recent study[147], the 1-RM was measured in seven different ways with 53 untrained men (n=25) and women with an average age of 51.2 (0.9) years. Chest press, leg press, lateral pull-down, triceps pushdown, knee extension, seated row and biceps curl were tested with a trial session and a test session 4-8 days later. The *Intraclass correlation coefficients* (ICC's) were >0.99.

Aerobic capacity
An increase or decrease in aerobic endurance is expressed in the increase or decrease in aerobic capacity ($VO_{2peak}$). It is possible to positively influence $VO_{2peak}$ by providing effective training stimuli. The gold standard in measuring $VO_{2peak}$ is a maximal cardiopulmonary exercise test on a bike/treadmill with breath by breath -gas analysis and an electrocardiogram (ECG). This test also enables the maximum heart rate and wattage and the ventilatory threshold to be determined, which can be used to set training parameters.

One review of high quality was found in which the quality of the exercise tests and data reported for cancer patients were studied. The conclusion was that execution of these tests did not meet national and international guidelines. The authors make recommendations for the method of testing and reporting of data for research and clinical care[127].

The American College of Sports Medicine[6] makes recommendations for the types of patients that should undergo a maximal cardiopulmonary exercise test[223]. See the chapter 'Intake', under Physical goals -I (diagram 2): exertional capacity and Appendix 20 (see appendix 20).

Submaximal exercise tests are not valid for measuring $VO_{2max}$ but may possibly be used to measure changes over time. However, there is not much evidence to support this. A recent study showed that the change in submaximal heart rate during a submaximal cycling test with a constant workload showed a moderate to strong correlation with changes in $VO_{2peak}$ ml/min and peak wattage (r=-0.51 and r=-0.69, respectively) if the cycling was of moderate to high intensity (140 heartbeats per minute or higher) in cancer patients[163]. However, the study only involved a small group of patients (N=27). The steep ramp test appears to be an acceptable alternative to determine training wattage and evaluate the effects of training (in wattage)[60]. This has only been demonstrated in a single study.

Cancer-related fatigue
A large number of different measurement instruments were used to measure cancer-related fatigue (CRF). The following measuring instruments were found: Fatigue Symptom Inventory (FSI), Fatigue severity scale (FSS), (revised) Piper Fatigue scale, POMS -fatigue, Brief Fatigue Inventory (BFI), Schwartz Cancer

Fatigue Scale (SCFS), Fatigue VAS, Fatigue FACT-An, Brief Fatigue Index (BFI), and the Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) as part of the FACIT-Anemia (FACIT-An).

In a recent review on CRF instruments, the BFI and the FACIT-F were found to be the best studied one-dimensional instruments and the FSI the best studied multidimensional instrument[3]. All three instruments have been translated into Dutch. Responsiveness has been better studied with the FACIT-F than the FSI. In a FACIT-F study[35], three clinical indicators (level of haemoglobin, performance status, treatment response) were used to calculate anchor-based differences. Half the standard deviation (SD) and 1 Standard Error of Measurement (SEM) was used as distribution-based criteria. A minimally important difference (MID) of 3 points was found for the FACIT-F. Another recent review evaluated the FACIT-F and the EORTC QLQ C30 cancer-related fatigue subscale as the most commonly used and best studied instruments.

Patrick et al.[198] studied the responsiveness of the FACIT-F in anaemic patients with cancer, treated with epoetin alpha, and used a change of 1 g/dl in haemoglobin level as external anchor. The MID in this study for the FACIT-F was 4.24 points.
The study researched 43 patients with lung cancer with an average age of 59 years during palliative chemotherapy. Those with more CRF had an average change of 5.0 (SE 1.06) points, those without a change in CRF 1.28 (SE 1.00) points and those with less CRF -1.52 (SE 0.84) points[220].

The responsiveness of the FSI has been studied in a Chinese group of cancer patients; this was measured before and after chemotherapy (interval of 2 days). The MID was 0.5 points per item for a small change, with an effect size of 0.97[231].

The Multidimensional Fatigue Inventory (MFI) has been developed in the Netherlands to measure cancer-related fatigue cancer patients[234] [235]. The MFI is a 20-item self-report instrument, which measures the following domains: general fatigue, physical fatigue, mental fatigue, reduced motivation and reduced activity. The psychometric characteristics of the MFI have been tested, in cancer patients during treatment with radiotherapy or chemotherapy and patients with chronic fatigue syndrome[175]. The responsiveness of the MFI has been studied in an American group of cancer patients (n=148, 34% breast cancer) being treated with radiotherapy or chemotherapy. Patients receiving radiotherapy completed the questionnaire in the last week of therapy and subsequently a month after treatment. Patients receiving chemotherapy completed the questionnaire two days after therapy and a day before the next therapy. The MFI was particularly sensitive to change, measured with an effect size (0.49). The other scales of the MFI had effect sizes between 0.16 (reduced motivation) and 0.40 (reduced activity)[167].

Pain
For the treatment of pain, the aim should be at least a clinically relevant reduction in pain (2 points on a 0-10 scale and/or a reduction by 30%) and preferably to a pain intensity of < 5. See the guideline 'Pain and cancer'.

Nutritional status
See the guideline 'General nutritional and dietary treatment' .

Sleep
Two studies used instruments to measure sleeping problems; the Pittsburgh Sleep Quality Index (PSQI)[27] and the Epworth Sleepiness Scale (ESS)[121]. Both lists have been translated into Dutch. No data was found on the responsiveness of these scales.

**Conclusions:**
Given the problems experienced with classification of evidence for this clinical question, the guideline working group decided neither to specify the quality of the selected articles nor to connect a level of evidence to the recommendations.

A trial session and standardised protocol is required to measure muscle strength using the direct or indirect one-repetition maximum (1-RM) in untrained men and women
Levinger 2009[147]

The gold standard to measure aerobic capacity (VO2peak), peak heart rate (HRpeak) and ventilatory

threshold is a maximal cardiopulmonary exercise test with ECG and breath by breath -gas analysis. The national and international guidelines for maximal testing must be adhered to. This test is suitable for diagnostics with cardiopulmonary problems, to determine training intensity and measure changes over time.
Jones 2008[127]

There is one study that supports the use of a submaximal constant workload to measure changes during a training programme, as long as the heart rate is 140 beats per minute or higher.
May 2010[163]

There is one study that supports the use of the steep ramp test to measure changes in maximal wattage achieved after training. This test cannot be used to measure changes in $VO_2$peak.
De Backer 2007[60]

Different studies indicate that the Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) is a one-dimensional instrument, which is sensitive to changes in cancer-related fatigue. De minimally important difference (MID) lies between 1.5-5 points.
Agasi-Idenburg 2010[3], Meek 2000[167]

One study supports sensitivity to changes in the Fatigue Symptom Inventory (FSI). The MID for small changes is 0.5 points per item.
Shun 2007[231]

One study supports sensitivity to change in the Multidimensional Fatigue Inventory (MFI).
Minton 2009[175]

In relation to sleeping problems, no evidence has been found for the responsiveness of the Pittsburgh Sleep Quality Index (PSQI) and the Epworth Sleepiness Scale (ESS)
Buysse 1989[27], Johns 1991[121]

**Considerations:**
The Multidimensional Fatigue Inventory (MFI) is most commonly used in clinical care in the Netherlands to measure cancer-related fatigue. The feasibility of the MFI is good and the instrument is reliable, valid and responsive.
No research was found on the most responsive exercise capacity measurements with cancer patients. One study supports the feasibility of a constant submaximal workload test with heart rates above 140 beats per minute, but the sample size was too small to start recommending this.

## Physical activity

**Recommendations:**
The guideline working group recommends the physical functioning scales of the SF/RAND-36 and the EORTC-QLC-C30 to measure limitations in physical functioning.

To determine physical functioning in patients with limited physical functioning, it is recommended to use the 6-minute walk test in a standardised manner according to the guideline of the American Thoracic Society[24].

It is recommended that the 10-metre shuttle walk test is used to determine physical capacity. In doing so, a one trial session should be conducted first.

It is recommended to conduct the 1-minute stair climb test and the sit to stand x 5 tests with patients who indicate having difficulty walking stairs and getting out of a chair.

It is recommended to ascertain if the patient meets the physical activity guideline.

The guideline working group advises against the use of physical activity questionnaires. The guideline working group recommends using objective measures of physical activities (e.g. accelerometer).

**Literature review:**

Questionnaires

The following questionnaires have been used to measure physical activity: the 7-Day Physical Activity Recall (7-Day PAR), 7-day Physical Activity Questionnaire (SAPAQ), International Physical Activity Questionnaire (IPAQ), Godin Leisure Time Exercise Questionnaire, The Scottish Physical Activity Questionnaire (SPAQ), Community Health Activities Model Program for Seniors Physical Activity Questionnaire (CHAMPS), Physical Activity Scale for the Elderly (PASE). Of these instruments, the 7-Day PAR, IPAQ and PASE have been translated into Dutch.

In a recent review on the validity of questionnaires in studies in which the criterion 'validity of questionnaires' was determined using the gold standard (doubly labelled water[1]), it was concluded that criterion validity as well as face validity is low. Many questionnaires do ask about activities that maintain or increase aerobic capacity (sport, cycling), but not about general daily physical activities such as activities of daily living (ADL), walking stairs, transport or sedentary activities [Neilson 2008]. Only the Questionnaires d'Activité Physique Saint-Etienne (QAPSE), Tecumseh Community Health Study (TCHS), Tecumseh Occupational activity and Minnesota Leisure Time Questionnaire (MLTQ) include all activities needed to measure Activity Energy Expenditure.

A review by Shephard[230] reports that physical activity questionnaires are not yet reliable and valid enough and that the responsiveness of these questionnaires has been poorly studied so far. A third review included 187 articles in which physical activities self-report was compared with objective measures[208]. Self-report measures of physical activity measured both higher and lower physical activity than physical activities measured objectively. In a study in which 10 questionnaires were validated simultaneously using doubly labelled water and $VO_{2max}$ in elderly males (73.4 +/- 4.1 years), it was concluded that the correlations were low to moderate. The highest correlations were found for intensive activities[17]. This suggests that physical activity questionnaires have inadequate validity, especially in populations with low to moderate physical activities. In general, the use of questionnaires as a measure of individual energy expenditure is limited[17].

Actigraphs / accelerometers / pedometers

A valid study conducted between 2002-2003 by the Alberta Cancer Board (Canada) compared a physical activity questionnaire, four 7-day physical activity logs and four sets of accelerometer data for 154 trial subjects (51% women, age 35-65 years). The authors used a measurement error model to determine the validity of the different ways to measure physical activity. Influencing factors and correlations between self-report measurements were taken into account. Validity was highest for accelerometers, followed by the physical activity logs and the lowest for the physical activity questionnaires[78].

Physical tests

The following physical tests have been found: 2-min stair climb test, 6-minute walk test, 12-minute walk test, *Rockport 1-mile walk test,* modified Canadian Aerobic Fitness Test (mCAFT), the modified shuttle test 10 meter course and the sit to stand x 5 test. Standard error of measurement (SEM) or one of the responsiveness measures was not available for any of these tests for healthy adults or cancer patients. The 10 meter shuttle walk test was investigated by Revill et al.[214]. In a study using lung cancer patients with normal or borderline lung function, the number of metres walked in the 10 metre shuttle walk test correlated significantly with $VO_{2peak}$ ($r=0.67$, $p<0.001$). The test underestimates $VO_{2peak}$ with low performance [Win 2006[284]]. This test has been shown to be reliable for patients with (advanced) cancer. The difference between sessions was an average of 1.4 metres. At least one trial session is required before measuring[18] [122]. The shuttle walk test was found to be reliable (intraclass correlation coefficient (ICC) =0.99, with an average difference between 2 tests of 2.5 metres) and responsive in patients with chronic lower back pain[247]. The shuttle walk test has been found to be responsive in patients with Chronic Obstructive Pulmonary Disease (COPD), with a reported Minimally Important Difference (MID) of 45-85 sec or 60-115 metres[201] and 47.5 metres[233].

Six physical tests were compared using Dutch patients with chronic aspecific back pain (n=198): the 5-minute walk test, 50-foot walking test, sit to stand x 5, the 1-minute stair climb test, loaded forward reach and the Progressive Isoinertial Lifting Evaluation (PILE) Test. Responsiveness was measured by calculating the area under the receiver operating characteristic (ROC) curve and the minimal detectable change (MDC), i.e. the 95% confidence interval for the measurement error. Only the 1-minute stair climb test and the sit to stand x 5 tests were found to be responsive, with an area under the curve (AUC) of 0.72

and 0.76. The minimally important change (MIC) had a range of 14.5 to 23.9 stairs (19%-31% of the average baseline score) for the stair climb test and 4.1 to 9.8 seconds (19%-45% of the average baseline score) for the sit to stand x 5 test[8].

There are normative values for healthy adults for the 6-minute walk test[75]. Research by Gibbons et al. describes reference values for healthy adults in the age category 20-80 years[88]. These values correspond with reference values for healthy adults (aged between 50-85 years) from research conducted by Troosters et al.[255]. It is recommended that this test is measured in a standardised manner according to the guideline of the American Thoracic Society[24]. The responsiveness of the 6-minute walk test has been tested in a group (n=100) of elderly people living at home (77.6 +/- 7.6 years of age) with mobility limitations. The SEM in this study was 21 metres[202]. In a comparable study with elderly people of the same age, the ICC was 0.93 and the average distance walked was 341 (SD 107) metres (i.e. a SEM of 28 metres)[134].

[1] The doubly labeled water method is used to determine metabolism. This is water in which both the hydrogen and oxygen have been partly or completely replaced for tracing purposes with an isotope of these elements.

**Conclusions:**
Given the problems experienced with classification of evidence for this clinical question, the guideline working group decided neither to specify the quality of the selected articles nor to connect a level of evidence to the recommendations.

Physical activity questionnaires are still not reliable and valid enough to use as a measure for individual energy expenditure. No evidence has been found for the responsiveness of the physical activity questionnaires used in the rehabilitation of cancer patients.
Shephard 2003[230], Prince 2008[208], Bonnefoy 2001[17]

Objective measures of physical activities (e.g. accelerometer) are more valid than subjective measures (e.g. activity questionnaires) of physical activities.
Ferrari 2007[78]

There is evidence for the measurement error or responsiveness of the 1-minute stair climb test and the sit to stand x 5 in Dutch patients with chronic aspecific back pain, but not with cancer patients.
Andersson 2010[8]

There is evidence for the measurement error or responsiveness of the 6-minute walk test in healthy elderly people, but not with cancer patients.
Enright 1998[75], Gibbons 2001[88], Troosters 1999[255], Brooks 2003[24], Perera 2006[202], King 2000[134]

There is evidence for the measurement error and responsiveness of the 10-minute shuttle walk test, but not with cancer patients.
Sing 2008[233], Pepin 2010[201], Taylor 2001[247]

**Considerations:**
It is important to measure and record limitations in physical functioning. The physical functioning scales of the SF/RAND-36 and the EORTC- QLQ-C30 can be used for this purpose.
A commonly used instrument in clinical care is the PSK (Patient Specific Complaints Questionnaire). This list is reliable, valid and responsive and can be used by patients with functional limitations due to pain.

In general, it is recommended to use physical tests as well as questionnaires in order to get a better total idea of how the patient is functioning[287]. Unfortunately there is still little evidence of responsiveness in physical tests. Nonetheless, these tests provide added value in clinical practice. The 1-minute stair climb test and the sit to stand x 5 tests were found to be responsive in Dutch patients with chronic aspecific back pain and these may be useful tests with cancer patients.

The 6-minute walk test and 10-metre shuttle walk test are responsive, but have not yet been tested with cancer patients. The 6-minute walk test is self paced while the pace is determined externally in the shuttle walk test. It would therefore seem that the 6-minute walk test is better in testing the capacity to walk and the shuttle walk test is better in testing functional (aerobic) capacity. It is further possible that a ceiling effect is reached in the 6-metre walk test with patients who are able to function reasonably well; the 10-metre

shuttle run would therefore seem to be a better alternative.

There is evidence that walking pace is associated with survival in elderly cancer patients[137] and in the healthy elderly[73]. It is therefore recommended that walking pace is determined when conducting the 6-minute walk test.

## Health-related quality of life

**Recommendations:**
It is recommended to use the EORTC QLQ-C30 or the Medical Outcomes Study Short Form 36 (SF-36 or the RAND-36) to measure health-related quality of life.

The EORTC QLC-C30 is preferable when patients have generic symptoms such as nausea, dyspnoea, constipation or loss of appetite, or symptoms specifically related to the type of cancer. The use of disease-specific modules is recommended with specific symptoms.

**Literature review:**
The following instruments have been found to measure Health-Related Quality of Life (HRQoL): Quality of life index for cancer patients (QOL), Rotterdam Symptom Check List (RSCL), Medical Outcomes Study Short Form 36 (SF-36), European Organization for Research and Treatment of Cancer Core set (EORTC QLQ C30), Functional Assessment of Cancer Therapy-General (FACT-G) Functional Assessment of Cancer Therapy-Breast (FACT-B), and the World Health Organization Quality of Life - abbreviated (WHOQOL-BREF). The most commonly used instruments are the SF-36 and the FACT-B and FACT-G. Two studies have compared the EORTC QLQ-C30 and the FACT-G and found moderate overlap. The conclusion was that there are substantial differences between the questionnaires and that the HRQoL outcomes of an intervention depend on the instrument used[131] [110] [111].

FACT-G
The FACT-G can be used for patients with all types of cancer[32]. Patients have been involved in development of the questions. The questionnaire has been written at primary school reading level and takes 5-10 minutes to complete. There are four domains: Physical well-being (PWB, 7 items), Social/family Well-Being (SWB, 7 items), Emotional Well-Being (EWB, 6 items) and Functional Well-Being (FWB). The questionnaire can be completed by pencil, telephone, or interview. A higher score means a better HRQoL. The total FACT-G score is the sum of PWB+SWB+EWB+FWB.

Cella et al. evaluated the responsiveness of the FACT-G in 308 patients (averaging 58.8 years) with cancer . The Minimally Important Difference (MID) for PWB was 2-3 points, EWB 2 points, FWB 2-3 points and Total FACT-G 3-7 points[35] [36]. Patrick et al. studied the responsiveness of the FACT-G in anaemic patients with cancer, treated with epoetin alpha, and used a change of 1 g/dl in haemoglobin level as an external anchor. The MID in this study for the FACT-G was 2.54 points[198]. Eton et al. studied women with metastatic breast cancer in two studies (N=739 and N=129). The MID in this study was 5-6 points[77].

FACT-B
The FACT-B is a derivative of the FACT-G and contains an additional subscale with questions relating to breast cancer[22]. The FACT-B consists of the following five subscales: physical well-being (7 items), functional well-being (7 items), emotional well-being (6 items), social or family well-being (6 items) and breast cancer (9 items). The answers to the different items are provided on a 5-point Likert-type scale. A higher score means a reduced quality of life. In two studies of women with metastatic breast cancer (n=739 and n=129), the FACT-B yielded an MID of 7-8 points and 2-3 points for the breast cancer subscale[77].

Short Form-36 (SF-36)
The SF-36 [Ware 1992[281]] is a multidimensional instrument, consisting of eight domains: physical functioning (10 items), role limitations due to physical problems, physical pain (2 items), general health perception (5 items), vitality (4 items), social functioning (2 items), role limitations due to emotional problems (3 items), mental health (5 items)[281]. In addition, one item asks about changes in health. The scores of the items are summed per dimension and translated to a scale of 0 to 100. A higher score means a better state of health. Two composite scores can be calculated: physical health (PCS) and mental health

(MCS).

Patrick et al. studied the responsiveness of the PCS and MCS composite scores of the SF-36 in anaemic patients with cancer, treated with epoetin alpha, and used a change of 1 g/dl in haemoglobin level as external anchor. The MID in this study for the PCS was 3.08 points and for the MCS -0.78[198]. The SF-36 has been researched in a large study using a Dutch heterogeneous group of cancer patients (N=485). The SF-36 was reliable and valid, and showed effect sizes between 0.30 for physical functioning and 0.86 for General Health, which can be interpreted as moderate to large. No significant change was seen in role limitations in physical and mental health. Normative data has been generated for this heterogeneous population [Aaronson 1998]. The acute version of the SF-36 has been translated into Moroccan Arabic and Tarifit and validated in a group of 90 Turkish and 79 Moroccan cancer patients (48 spoke Moroccan Arabic and 31 Tarifit)[113]. The average time for the SF-36 to be completed was 19.8 min and 17.6 mins for the Moroccan and Turkish patients respectively (with a distribution of 5-55 min). The SF-36 was reasonably reliable and valid with a better responsiveness with the Turks than with the Moroccans.

EORTC QLQ-C30
The EORTC QLQ-C30[1] outlines a number of aspects of quality of life, including: physical functioning; indicates to what extent someone is able to perform exertion activities; role functioning; deals with the ability of the patient to participate in the labour process, perform hobbies and household tasks; emotional functioning; deals with the extent the participant is stressed or irritable, as well as the extent to which the participant worries; cognitive functioning; the extent to which sometime can remember things and is able to concentrate; social functioning; the extent to which a patient has a family or social life. The questionnaire also asks about symptoms, such as pain, nausea, sleep, shortness of breath, cancer-related fatigue and constipation, diarrhoea and financial problems and there are two questions about general quality of life. It has been translated into 81 languages and can be completed in 10-15 minutes. A difference of more than 10 points on the EORTC QLQ-C30 indicates a clinically relevant change (MID)[194].

The EORTC-C30 has been translated into Moroccan, Arabic and Tarifit and validated in a group of 90 Turkish and 79 Moroccan cancer patients (48 spoke Moroccan Arabic and 31 Tarifit). It took on average 10 minutes to complete (range 2-30). The questionnaire had a reasonable reliability and validity, but the responsiveness was moderate. This was partially attributed to the high ceiling and floor effects in some scales[112]. In a study amongst Canadian women with breast cancer (N=235) and metastases[146], who were treated in an expressive and supportive group therapy, the MID was 0.5 SD (baseline), which corresponds with the MID reported by Osoba et al. for patients with breast or lung cancer during chemotherapy[195].

The WHOQOL-BREF
WHOQoL-Bref[290] is the short version of the WHOQoL-100[289] [291]. The instrument consists of 26 items, of which 24 items are subdivided in 4 domains (psychological, physical health, social contact and environment). There are also two items in the questionnaire relating to the overall quality of life and general health state. Item scores are assigned on a 5-point scale. The possible score range differs per domain. The end score ranges from 4-20. A higher score means a better state of health[290]. No evidence was found that the WHOQoL-BREF has been validated for cancer patients.

Rotterdam Symptom Checklist (RSCL)
The Rotterdam Symptom Checklist asks patients to what extent they have suffered from 30 disease-related symptoms in the last three days[65]. ADL items have been added in order to determine functional status. Answers are provided on a 4-point Likert-type scale (not at all; a little; quite a bit; extremely). A higher score means greater evidence for worsening in activities of daily living. Many of the symptoms may also be an expression of anxiety/depression and this list is therefore also used to measure anxiety/depression. According to the RSCL guideline, the RSCL is sensitive to change, but no evidence has been found for this in literature.

**Conclusions:**
Given the problems experienced with classification of evidence for this clinical question, the guideline working group decided neither to specify the quality of the selected articles nor to connect a level of evidence to the recommendations.

There is evidence from multiple studies that the Functional Assessment of Cancer Therapy-General (FACT-G) is responsive to measuring health-related quality of life in cancer patients. The minimally

important difference (MID) lies between 2.6 and 7 points.
Cella 2002[35], Cella 2002[36], Patrick 2003[198], Eton 2004[77]

There is evidence from one study that the Functional Assessment of Cancer Therapy-Breast (FACT-B) is responsive to measuring health-related quality of life in patients with breast cancer
Eton 2004[77]

There is evidence from multiple studies that the Medical Outcomes Study Short Form 36 (SF-36) is responsive to measuring health-related quality of life in cancer patients.
Patrick 2003[198]

There is evidence that the SF-36 is reasonably reliable, valid and responsive with Turkish and Moroccan cancer patients.
Hoopman 2006[113]

There is evidence from multiple studies that the EORTC QLQ-C30 is responsive to measuring health-related quality of life. Various studies have reported an MID of 0.5 $SD_{baseline}$.
Osoba 1999[194], Osoba 1998[195], Lemieux 2003[146]

There is evidence that the EORTC QLQ-30 is moderately responsive with Turkish and Moroccan cancer patients.
Hoopman 2006[112]

No evidence has been found that the WHOQoL-BREF has been validated for cancer patients to measure health-related quality of life.
Guideline working group

No evidence has been found that the Rotterdam Symptom list (RSCL)[65] is responsive to measuring health-related quality of life in cancer patients.
Guideline working group

**Considerations:**
Both the SF-36 and EORTC QLC-C30 can be used with Turkish and Moroccan cancer patients. The SF-36 is not in the public domain, but the RAND-36 is. The difference lies in the scoring and is minimal. The EORTC QLC-C30 also asks about more symptoms than the SF/RAND-36 and asks about the ‘last week'. The SF/RAND-36 asks about the ‘last month', although there is an acute version of the ‘last week'. The EORTC QLC-C30 may be supplemented with disease-specific modules.

# Psychology

**Recommendations:**
It is recommended to use the Center for Epidemiology Depression-Scale (CES-D) to measure complaints of depression.

It is recommended to use the 10-item State subscale of the State Trait Anxiety Inventory (STAI) to measure anxiety.

**Literature review:**
A large number of instruments are included in the psychological domain; on the one hand, they measure general psychological concepts such as anxiety and symptoms of depression, and on the other hand, they measure specific concepts such as body image, relevant for specific types of cancer. Independent of the nature of the concepts, all questionnaires have been developed for use in multiple populations and not specifically in cancer populations. Most questionnaires have been validated largely in non-cancer populations. For general concepts, data relating to responsiveness can be obtained from general literature; whether or not the questionnaires are also responsive for the cancer patient population is strongly dependent on the relevance of the concept concerned in the cancer population. The general concepts

involved are outlined below.

Distress
In practice, distress (general ill-being) is often measured with the total score on the Hospital Anxiety Depression Scale (HADS)[297 241]. The HADS has been specifically developed for use in somatic populations and does not contain items that overlap with physical complaints, such as a shortage of sleep or reduced appetite. The list consists of two subscales that measure anxiety and complaints of depression, respectively. The psychometric properties of the HADS as a whole are assessed to be good, in which it is noteworthy that it has been given a moderate score for validity[277]. In relation to the use of both scales separately, use of the total score is deemed as good or even superior from a psychometric viewpoint. The HADS is used regularly in studies with cancer patients, including Dutch studies. The scores on the questionnaire have been found to show interpretable changes over time, which supports responsiveness[107]. The total score lends itself to detection of complaints on an individual level and is used as such with cancer patients. However, a problem with the qis that there is no consistency in literature regarding the cut-off point[277].

A commonly used questionnaire to measure distress, also amongst cancer patients, the General Health Questionnaire, did not come up in the literature search and is therefore not outlined here.

Anxiety
Anxiety can be measured with two questionnaires:

- The State Trait Anxiety Inventory (STAI)[240 260]
- The Anxiety subscale of the Hospital Anxiety Depression Scale (HADS)[297 241 107 277] discussed above.

The STAI contains two scales, the trait scale that measures anxiety as a stable characteristic and the state scale that measures anxiety as a state that may vary over time. The questionnaire consists of 20 items evenly divided across both scales. In addition, there is a shortened version consisting of six items. The full state scale is regularly used in studies with cancer patients[68 140], as well as the six-item version. Both versions of the state scale appear to show interpretable changes over time[68 128 104]. The STAI is used, amongst other things, as a criterion measure to validate the distress thermometer. The 20-item version has been validated in the Netherlands and has good psychometric characteristics; there is no known validation with cancer patients. There is no known validation data for the 6-item version in the Netherlands.

The anxiety subscale of the HADS can be used as an independent scale to measure complaints of anxiety. Similar to the total HADS, the psychometric characteristics of this subscale leave a lot to be desired.

Depression symptoms
Symptoms of depression can be measured with:

- The Center for Epidemiology Depression-scale (CES-D)
- The Beck Depression Inventory (BDI)
- The Depression-subscale of the Profile of Mood States (POMS)
- The Depression-subscale of the Hospital Anxiety Depression Scale (HADS)

The CES-D is a 20-item questionnaire that consists of four subscales: depressive mood, positive affect, physiological complaints and interpersonal relationships[210 21]. The total score of the questionnaire is normally used. The psychometric qualities of the CES-D have been assessed to be excellent in a review article by Vodermaier[277]. The scale was found to be sensitive to changes over time in cancer patients, i.e. there are interpretable changes over time[67 225 226]. The CES-D has been found to be suitable for use on an individual level. In a study with cancer patients, the subscale positive affect was not valid as independent subscale nor did it fit the depression concept[224]. The authors propose a 16-item version that only consists of the negatively formulated items. Cut-off points can also be calculated for this version by means of extrapolation.

The Beck Depression Inventory (BDI) is a 21-item questionnaire that, in totality, gives an indication of the severity of depression. The items are comparable to those of the CES-D, although the BDI does not contain items that measure positive affect. The BDI list has excellent psychometric characteristics and, together with the CES-D, is one of the best validated depression questionnaires[277]. There are also

shortened versions of the questionnaire, including a 13-item version, but these have received a poor assessment by Vodermaier. A Dutch version of the questionnaire is also used in Dutch studies, but data on responsiveness in Dutch cancer population is lacking.
The Depression subscale of the HADS consists of seven items and can be used as an independent scale to detect complaints of depression. This subscale appears to have the worst psychometric characteristics in comparison with the total score of the HADS and the anxiety subscale. From a study with breast cancer patients, it appears that depression and anxiety, as measured with the HADS subscales, show a comparable pattern over time[107]. However, when distinct scales are used to measure anxiety and depression, the shortened State Trait Anxiety Inventory and the CES-D, the pattern is very different[104]. This suggests that there may not be sufficient distinction between the anxiety and depression subscales of the HADS.

The Profile of Mood States (POMS) depression scale has eight adjectives that aim to measure symptoms of depression. This scale is part of the total POMS-SF that contains 37 items and, aside from the depression subscale, also has scales for vitality, anger, stress, confusion and fatigue and is suitable as screening instrument in its entirety. The psychometric qualities of the total POMS is rated poorly, partly through the lack of adequate validity data[277].
In can be summarised that based on quality, the CES-D is the best choice to measure complaints of depression. The HADS is an alternative when a short list is preferable; however, it must be noted that the validity of the HADS has been assessed to be moderate in the review article by Vodermaier et al.[277]. The CES-D and the HADS have been found to be responsive in populations of cancer patients, and both questionnaires are regularly used in studies in the Netherlands. Both questionnaires are suitable for use on an individual level, i.e., to identify cases at risk. The 21-item version of the BDI has also been assessed as good in the overview article by Vodermaier et al.[277], and is also used in studies with cancer patients in the Netherlands[94], but data on responsiveness are lacking.

Affect
Both positive and negative affect are measured by the Positive Affect Negative Affect Scale (PANAS). The questionniaire contains twenty adjectives distribtued evenly across both scales. Limited use is being made of the questionnaire in studies with cancer patients. In the Netherlands, the questionnaire has been validated in a general population[200] and has been used with cancer patients[300] but not specifically validated in this population. Data on responsiveness with cancer patients are lacking.

General well-being
General wellbeing is measured with the Satisfaction With Life Scale (SWLS). This scale contains five items that contain a high internal consistency. The scale is generally non-responsive and within that context does not lend itself to measuring changes over time[30].

Self-esteem
Self-worth is measured with two questionaires, of which the Rosenberg Self-Esteem scale (RSE) is the most well known[218]. The other is the Coopersmith Self-Esteem Inventory; it was difficult to find additional information about this questionnaire. The RSE contains 10 items; five positive and five negative. The Dutch version has been validated in Belgium[82], showing that the questionnaire contains one scale. Data on responsiveness is lacking, although an American study[232] shows that the scores correspond with age, education and ethnical status, which provides indirect evidence for responsiveness of the questionnaire. Validation in a population of cancer patients and data on responsiveness in the cancer population are lacking.

Body image
Body image is measured by various questionnaires, including:

- The Body Esteem Scale (BES)
- The Physical Self-Perception Profile
- The Social-Physique Anxiety Scale (SPAS-7)

These lists are mainly used with children and adolescents. Little information can be found regarding validation in the Netherlands, nor with regards to responsiveness in general or specifically in relation to cancer patients.

**Conclusions:**
Given the problems experienced with classification of evidence for this clinical question, the guideline working group decided neither to specify the quality of the selected articles nor to connect a level of evidence to the recommendations.

The Hospital Anxiety Depression Scale (HADS) is the most commonly used instrument to measure ill-being (distress). The list is responsive and potentially suitable for use on an individual level. However, there is no agreement regarding cut-off points and the validity leaves a lot to be desired.
Vodemaier 2009[277], Spinhoven 1997[241], Hinnen 2008[107]

The 20-item version of the State Trait Anxiety Inventory (STAI) is to be preferred when measuring anxiety. The 10-items State subscale may be used in particular; this subscale has been especially constructed to measure anxiety as a state. The scale has good psychometric characteristics and has been found to show interpretable changes over time.
Van der Ploeg 1979[260], Den Oudsten 2010[68]

The Center for Epidemiology Depression-scale (CES-D) is to be preferred when measuring symptoms of depression, given the psychometric characteristics and validity data for this list. The CES-D has been validated amongst cancer patients in the Netherlands and has been found to be show. interpretable changes over time in cancer patients.
Vodermaier 2009[277], Schroevers 2003[225], Schroevers 2003[226], Den Oudsten 2009[67]

**Considerations:**
It is recommended to use the Center for Epidemiology Depression-Scale (CES-D) to measure symptoms of depression. From a clinical practice viewpoint, an objection is that several items are sometimes experienced as confronting. At the same time, the fact this questionnaire is frequently used shows that completing the questionnaire does not always have to be problematic. The alternative, the Hospital Anxiety Depression Scale (HADS) does not have the psychometric quality required: sensitivity and specificity leave a lot to be desired.

It is recommended to use the EORTC QLQ-C30 or the Medical Outcomes Study Short Form 36 (SF-36 or the RAND-36) to measure health-related quality of life. The contents of the questionnaires are similar; the EORTC QLQ-C30 asks a little more about symptoms. Both instruments are responsive. Neither instrument includes questions about physical limitations of upper extremities, which may be a drawback for patients with breast cancer.

# Empowerment

**Recommendations:**
To stimulate participation in rehabilitation by patients who are eligible or patient who indicate a need for rehabilitation (internally directed interventions), it is recommended to enhance the patient's perceived behavioural control (self-efficacy) regarding rehabilitation, for example by:

- Showing how comparable patients have been capable of carrying out the different components of a programme and what effects they may experienced in doing so (shown by a model).
- Allowing patients to participate in a trial session or training.

In order to stimulate participation, it is also recommended that a positive attitude in relation to participation and a social norm for participation are promoted, for example by:

- Emphasising the positive effects and fun in participation (strengthening attitude).
- Making the importance of rehabilitation clear to significant others, such as partners or family members, so that they will also stimulate the patient to participate (strengthening the subjective norm).

In advising participation in a rehabilitation programme, it is recommended that the motivation for participation is discussed. This is op particular importance for older patients (>65 years of age) and it should be made clear that rehabilitation is also effective for them.

The guideline development group recommends paying special attention to vulnerable groups of patients, such as patients without social support, patients who are self employed, and young people in the workforce without a permanent job or salary.

To promote therapy compliance, it is recommended that attention is given to strengthening the behavioural control (self-efficacy) of patients in relation to rehabilitation. Amongst other things, this can be achieved by:

- Demonstrating how comparable patients correctly and fully carry out physical training and experience the positive effects of this.

It is recommended that healthcare providers (physicians, nurses) advise patients eligible for rehabilitation to participate in a rehabilitation programme that is effective and developed specifically for cancer patients. It is recommended to approach the provision of information and advice in a systematic manner. To this end, alignment and consultation with the general practitioner is desirable.

It is recommended when executing a rehabilitation programme that not only the physical, psychological and social circumstances are explicitly taken into account, but also the personal goals and limitations of the patient. This applies to all forms of rehabilitation, but certainly for people in the palliative phase.

The guideline working group recommends that professionals with practical knowledge and experience (for example, from patient associations) are involved in providing information to new patients about rehabilitation programmes. They can stimulate patient participation in rehabilitation and provide support at the time of rehabilitation.

The guideline working group recommends involving a patient's family member(s) at various important moments in the care and treatment process when decisions about rehabilitation are taken. They may optimise support to the patient.

**Literature review:**
Introduction
Approximately 26% of people who survive cancer in the Netherlands report a reduced quality of life. They indicate a need for professional support in dealing with problems that occur after diagnosis and as a result of treatment[263 90]. Conservative estimations indicate that of the newly diagnosed Dutch patients with cancer in the year 2000, approximately 4,890 cancer survivors had a need for professionally supported rehabilitation. As a result of the increase in cancer diagnoses, the number of new patients with a need for

rehabilitation in 2015 will have increased to 6,900[90]. Only a minority of these patients receive such rehabilitation. Assuming that certain cancer rehabilitation interventions are effective in contributing to resolving or learning to deal with physical and psychosocial problems as a result of cancer, it can therefore be expected that greater participation in rehabilitation interventions will be beneficial. Clearly there are barriers that hinder participation in these rehabilitation interventions.

Accountability for selection of the literature

A systematic review of the literature was conducted to help in answering the general question 'How can the empowerment of the (ex-)patient be increased so that cancer rehabilitation is possible?'. This review of the literature was based on empirical studies of the following subjects:

1. Determinants of participation in rehabilitation: the factors are outlined that determine if cancer patients do or do not participate in cancer rehabilitation interventions.
2. Determinants of therapy compliance with exercises: the research results are outlined which focuss on the factors that determine if participants of rehabilitation interventions will execute components of the interventions as intended (this is called therapy compliance).
3. Internal and external validity of interventions for physical exercise: the effects of interventions aimed at improving participation in rehabilitation interventions are outlined.
4. Interventions that promote participation in rehabilitation: a search was also conducted of studies on the effectiveness of interventions which focussed on strengthening the empowerment of cancer patients. In this context, empowerment was considered a broad term that refers to concepts such as strengthening self management, self regulation, self-efficacy, being self aware, taking own responsibility and contact with fellow patients. However, controlled experimental studies researching the effects of interventions on the empowerment of patients were not found.

One systematic literature review was found on the determinants of patients with prostate cancer performing physical activity (physical exercises) and two empirical studies on the determinants of participation in a rehabilitation programme by cancer patients. Three empirical studies were also found on the determinants of therapy compliance with exercise programmes (the degree to which a patient follows the prescribed physical training) and one systematic review of randomised studies on the internal and external validity of interventions for physical training in breast cancer patients (see evidence table 10). In addition, two controlled experimental studies were found in which interventions were tested to promote execution of rehabilitation activities in line with how they were intended (see evidence table 11).

Determinants of participation in physical activities

In the systematic literature study by Thorson et al., perceived behavioural control (the perception of control over a certain behaviour), a concept from the Theory of Planned Behaviour[1], was found to explain physical activity to a high degree[250]. It also appeared from this study that perceived behavioural control and the subjective norm (perception of what relevant others, such as healthcare providers and family, believed what should be done) in relation to physical training, were predictors of the intention to execute physical training. It further showed that a young age and a higher intention predicted higher therapy compliance with a physical training programme. The concepts of the Theory of Planned Behaviour also predicted the degree of physical activity of cancer patients[126 130]. In both empirical studies it appeared that the intention to be physically active and intention to exert oneself correlated with perceived behavioural control and the *instrumental attitude* (finding it useful and effective) and *affective attitude* (finding it fun or interesting and engaging)[126 130]. The intention to be physically active was found to correlate with actual physical activity. Also, the perceived behavioural control correlated with actual physical activity. Older patients and those with a more invasive cancer were less likely to participate in physical training.

Determinants of therapy compliance with physical training

Therapy compliance with instructions or prescribed exercises was examined in three studies[206 48 50]. In the study by Pinto et al. (a home-based programme), therapy compliance was found to correlate strongly with perceived behavioural control[206]. Performing exercises as intended was found to strongly correlate with exercise self-efficacy [Courneya 2002]. Exercise self-efficacy is a concept that is closely related to perceived behavioural control and refers to the confidence in being able to carry out specific exercises. Aside from physical training in the past, normative considerations, extraversion [2], gender and intention to perform exercises correlated with therapy compliance in the study by Courneya et al. Men were found to have a higher therapy compliance than women[48]. In the study by Courneya et al.[50], patients who had a higher intention of physically training beforehand, patients with a higher level of exercise stage of change[158], and patients younger than seventy years of age had a higher therapy compliance.

Internal and external validity of interventions for physical training
One systematic literature review was found in which the aim was to determine to what degree interventions of physical exercises for breast cancer patients paid attention to the internal and external validity of the interventions. White et al. evaluated 25 randomised trials making use of the Reach, Efficacy/effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) model[93]. The study showed that attention was paid to the internal validity of the interventions (effectiveness in terms of the effect on quality of life, fatigue, physical functioning, other psychosocial variables such as anxiety and depression) in most studies[283]. However, in these studies little attention was given to the external validity of the interventions (generalisability). No studies were conducted on the adoption and implementation of interventions at an organisational level. Similarly, little is known about the continuity in the application of the interventions by the organisations involved. Based on the studies in this review, no conclusions can be drawn about the applicability of the interventions researched for the population of breast cancer patients as a whole.

Interventions that promote participation in rehabilitation
Two RCT's were found. In the first RCT, Jones et al. first studied the effect of two experimental conditions with:

1. A recommendation by the oncologist to meet the Dutch norm for healthy exercise
2. A recommendation by the oncologist to meet the Dutch norm for healthy exercise PLUS a referral to a specific rehabilitation centre, were compared to
3. A control condition without recommendation and without referral[123].

Only the condition in which a recommendation was made by the oncologist to meet the Dutch norm for healthy exercise was found to lead to more physical activity. In the same RCT, Jones et al. also studied if the constructs of the Theory of Planned Behaviour [1] mediated the effect of a recommendation for performing physical exercises[124]. This showed that both a recommendation to meet the Dutch healthy physical activity guideline only and the same recommendation PLUS a referral to a specific rehabilitation specialist lead to a stronger willingness to comply with the oncologist's expectations, to a positive attitude towards performing moderate physical activity, and to a stronger intention to be physically active[124].
In a second small RCT, motivational interviewing was found to have a significant effect on the intensity of the physical activity[15]. Motivational interviewing is a directive, person-focused counselling style for the promotion of behavioural change by helping a patient to clarify ambivalent motives and solve ambivalence. In doing so, no effects were identified on fitness or mental health.

[1] The 'Theory of Planned Behaviour' is a model that indicates what factors determine the decisions by a person to perform particular behaviour. According to this model, the intention to perform a particular behaviour (behavioral intention) and the perceived control over that behaviour (perceived behavioural control) are the direct predictors of the behaviour. The perceived control corresponds strongly with the self-efficacy concept from the social learning theory by Bandura: the self-confidence that one is able to perform a particular behaviour. The behavioural intention concerns the conscious plan or the decision to actually perform the behaviour. The behavioural intention itself is determined in turn by three factors: 1. the attitude in relation to the behaviour, 2. the subjective norm (perception of what other relevant persons believe should be done) and 3. once again the perceived behavioural control. Perceived behavioural control can therefore exert a direct or indirect influence (via the intention) on performing the behaviour. The perceived behavioural control is determined by an estimation of the skills required for the behaviour and estimation of ability to overcome barriers in performing the behaviour. Attitudes are determined by specific beliefs in relation to the expected consequences of the behaviour and beliefs regarding the outcomes of the behaviour. Subjective norm is determined by specific normative beliefs (estimating what specific persons believe in relation to what should or should not be done)[80] [46].
[2] Extraversion refers to one's energy being directed outwards to people, activities and things.

**Conclusions:**
It is plausible that the intention to exert oneself, correlates with the perceived behavioural control (the confidence to execute the intended behaviour), with an instrumental and affective attitude, and with the subjective norm regarding physical activity. This intention to exert oneself, appears to correlate with actual participation in an exercise programme.
Level 2: B Jones 2007[126], Karvinen 2009[130], Courneya 2004[50], Thorsen 2008[250]

There are indications that the degree of physical activity strongly correlates with perceived behavioural control.
Level 3: B Thorsen 2008[250]

It is plausible that the age of cancer patients is of influence on therapy compliance with physical training, in which younger patients show more therapy compliance than older patients.
Level 2: B Thorsen 2008[250], Karvinen 2009[130]

It is plausible that therapy compliance with physical activities is predicted by exercise self-efficacy (the confidence in oneself to be able to carry out the specific exercise behaviour) and perceived behaviour control.
Level 2: B Pinto 2009[206], Courneya 2002[48]

There are indications that a recommendation by an oncologist to be moderately active every day (for 20-30 minutes) leads to an increase in carrying out physical activity.
Level 3: B Jones 2004[123]

There are indications that a recommendation to be moderately physically active every day for 20-30 minutes, leads to:
- a greater willingness to comply with the expectations of the oncologist to be physically active
- to a positive attitude in relation to physical activities, and
- to a stronger intention to be physically active
Level 3: B Jones 2005[124]

As yet, there are hardly any indications that intervention programmes for the rehabilitation of breast cancer patients can be generalised to the entire population of patients and can be applied in the context of rehabilitation organisations.
Level 3: C White 2009[283]

**Considerations:**
According to Aujoulat et al., empowerment can also be seen as a complex process of self change in the client, facilitated through a specific attitude of the professional who acknowledges the needs and wishes of the patient[9]. Empowerment of the patient is important to enable the patient to make choices regarding rehabilitation during and after medical treatment. Empowerment will also increase the chances for a full participation in rehabilitation.

To stimulate patient participation in rehabilitation and to increase the chance that patients in fact carry out these programmes as intended, the Theory of Planned Behavior[80] and the Social Cognitive Theory[11] can be effectively applied. Methods that can be used here are:

- The application of social modelling or observational learning (e.g. demonstration to new patients of rehabilitation exercises by other patients)
- Enactive learning (e.g. providing the option of a trial session in which the desired behaviour such as physical exercise can be practiced)
- Promoting good physical and emotional conditions (being rested and free of stress when starting a new rehabilitation behaviour/exercise),
- Verbal persuasion (e.g. helping to make choices between alternatives, becoming aware of the benefits, stimulating the patient).

When healthcare providers who are directly involved provide information about rehabilitation programmes it is further important that attention is given to promoting a positive attitude; for example, by pointing out the effectiveness and benefit of rehabilitation when providing information and emphasising the positive emotions upon successful rehabilitation. When multiple effective forms of rehabilitation are available, information should also be provided about alternatives, so that patients are able to make well-considered choices as to what kind of programme or exercise best fits their situation. In providing information, special attention should be given to older patients and patients with invasive cancer or treatments.

Participation in rehabilitation can also be promoted by influencing external factors. It is of particular importance here that the healthcare providers involved (physicians, nurses) explicitly point out the

possibilities and importance of rehabilitation to patients eligible for rehabilitation.

Although there are no research data available on the involvement of fellow patients and patient associations in rehabilitation programmes, the guideline working group is of the opinion that fellow patients and patient associations may play an important role in promoting participation in rehabilitation programmes by new patients. Especially the sharing of experiences by patients that have previously participated in a rehabilitation programme may help patients to make the decision as to whether or not to participate in such a programme. As a role model, they may be able to strengthen the patient's self-confidence.

It can also be stated that an effective rehabilitation programme addresses the specific problems and aims of the patient, also with an eye for the limits of the patient. The programme should be easily accessible. This requires sufficient national distribution, financial feasibility and for the programme to be conducted frequently enough, so that patients are able to commence rehabilitation at the point in time they should be starting the programme.

To increase the chance that patients in fact carry out a recommended rehabilitation programme as intended, strengthening behavioural control or self-efficacy in relation to physical training is again of importance[12]. Comparable methods to those indicated previously to promote participation in rehabilitation can be applied here.  Emphasising the importance of correctly executing rehabilitation, for example by relevant healthcare providers, fellow patients and/or patients associations and significant others, such as partner or family members, is also of importance. This is called strengthening normative believes.

Based on limited research, a few recommendations can be made aimed at promoting participation in rehabilitation and promoting execution of rehabilitation by patients as intended. It must be noted that the external validity of these studies is limited. In other words, there are still a lot of questions regarding generalisability of the findings for the total population of cancer patients and the feasibility of its application for the total population, as is indicated in a recent evaluation of randomised trials of interventions for breast cancer patients[283]. Some recommendations are based on the opinion of the guideline working group.

# Work

**Recommendations:**
**Key question**
How effective are support, advice and interventions (nursing and otherwise) which are focused on work during and after completion of treatment of cancer with curative intent, on participation in employment, quality of life, meaningful activities of daily living, fatigue and cognitive functioning?

**Recommendation**
More research is necessary into the effectiveness of interventions focused on stimulating participation in work during planned curative treatment.

More research is necessary into the effectiveness of interventions focused on stimulating participation in work following planned curative treatment.

**Literature review:**
Description of the studies
Three systematic reviews evaluated the effect of interventions focused on work in patients with cancer [De Boer 2011[361], Egan 2013[362], Tamminga 2010[368]]. The most complete review was that of De Boer [De Boer 2011[361]]. A search of the literature up to February 2010 found two randomised studies and three controlled before-after studies that compared psychological interventions with usual care, one randomised study that evaluated a training intervention and three randomised studies that evaluated multidisciplinary interventions. There was not a single study that investigated work-related interventions. Tamminga's review is older and found no concomitant studies [Tamminga 2010[368]]. Egan's most recent review [Egan 2013[362]] referred to the reviews of De Boer and Tamminga, and found no further new studies.
Since 2010 another four randomised studies have been published [Björneklett 2013[359], Hubbard 2013[363], Sherman 2012[366], Tamminga 2013[367]]. These studies included a total of 786 patients with cancer (mainly breast cancer).
None of the reviews distinguished between interventions focused on work during treatment with curative intent or on interventions after treatment with curative intent had been completed. After analysis of the six randomised studies in the review of De Boer, two studies proved to have been carried out during treatment with curative intent and four studies after treatment with curative intent had been completed [De Boer 2011[361]]. Of the four more recent randomised studies, one had been carried out during treatment with curative intent [Sherman 2012[366]], and three after treatment with curative intent had been completed. [Björneklett 2013[359], Hubbard 2013[363], Tamminga 2013[367]].

Quality of the evidence per outcome measure
The reviews of De Boer [De Boer 2011[361] and Tamminga [Tamminga 2010[368]] are of good quality. Egan's review is of less good quality, as the description of the methodology that was used was less than complete [Egan 2013[362]]. The six randomised studies in De Boer's review had a high risk of bias due to unclear allocation concealment, the unavoidable absence of blinding and the lack of an intention-to-treat analysis [De Boer 2011[361]].
Of the four randomised studies, only Sherman's study had a low risk of bias [Sherman 2012]. The other three studies had a high risk of bias due to unclear allocation concealment, absence of blinding and the lack of an intention-to-treat analysis [Björneklett 2013[359], Hubbard 2013[363], Tamminga 2013[367]]. For purposes of this guideline, it was decided that the data from the randomised studies found should not be pooled.

Interventions during treatment with curative intent
*Physical activity (crucial outcome measure)*
None of the randomised studies reported on the effect on physical activity.

*Activities of daily living (crucial outcome measure)*
None of the randomised studies reported on the effect on activities of daily living.

*Self-efficacy (crucial outcome measure)*
None of the randomised studies reported on the effect on self-efficacy.

*Cognitive functioning (crucial outcome measure)*
None of the randomised studies reported on the effect on cognitive functioning.

*Partial return to work (important outcome measure)*
De Boer did a meta-analysis on three randomised studies that evaluated the effect of a multidisciplinary intervention [De Boer 2011[361]]. Two of these studies were carried out during planned curative treatment. In one study [Burgio 2006[360]] behavioural training with biofeedback was combined with pelvic floor exercises. Return to work was measured at 6 months. In the other study [Maguire 1983[364]], exercise therapy was combined with education and counselling. Return to work was measured at 12-18 months. No significant effect was found on complete or partial return to work (relative risk 1.20, 95%CI 0.97-1.49).
Sherman reported the effect of psycho-education and/or telephone counselling on work-related wellbeing, but found no significant difference with usual care [Sherman 2012[366]].

*Quality of life (important outcome measure)*
None of the randomised studies reported on the effect on quality of life.

*Fatigue (important outcome measure)*
None of the randomised studies reported on the effect on fatigue.

Interventions after treatment with curative intent
*Physical activity (crucial outcome measure)*
In the review of De Boer, two randomised studies reported the effect of a psychological intervention (education with or without group discussions) on physical functioning (measured as a sub-scale of quality of life) [De Boer 2011[361]]. No significant effect was found (average difference 1.43, 95%CI -0.71 to 3.57).
On the FACT-B physical wellbeing sub-scale, Hubbard found no significant effect of vocational rehabilitation at 6 and 12 months (average difference 1.2 for both time points, p=0.68 and 0.56 respectively) [Hubbard 2013[363]].
Using the SF-36 physical functioning sub-scale, Tamminga too found that a multidisciplinary intervention (education vs. plan for gradual return to work) had no significant effect (81 vs 79, p=095) [Tamminga 2013[367]].

*Quality of life (crucial outcome measure)*
The two randomised studies in the review of De Boer also reported the effect of education with and without group discussions on mental functioning as measured on a sub-scale of quality of life [De Boer 2011[361]]. Here too, no significant effects were found (average difference 0.14, 95%CI -1.62 to 1.91). In another randomised study, an intervention to promote physical activity for quality of life equally found no significant effect (average difference 4.6, 95%CI -11.99 to 2.79).
On the FACT-B physical wellbeing sub-scale, Hubbard found no significant effect of vocational rehabilitation at 6 and 12 months (average difference 10.1 and 6.6, respectively; p=0.33 and 0.51, respectively) [Hubbard 2013[363]].
At 12 months Tamminga found that multidisciplinary intervention (education and plan for gradual return to work) had no significant effect on quality of life, measured on the VAS scale (p=0.26) and the SF-36 [Tamminga 2013[367]].

*Complete return to work (crucial outcome measure)*
In the review of De Boer, two randomised studies found no significant effect of a psychological intervention (education with or without group discussions) on return to work (partial and complete; relative risk 1.21, 95%CI 0.96-1.51) [De Boer 2011[361]]. Another randomised study also found that an intervention promoting physical activity had no significant effect on return to work (partial and complete; odds ratio 1.20, 95%CI 0.32-4.54) [De Boer 2011[361]]. One randomised study on the effect of a multidisciplinary intervention found that this had no significant effect on return to work (relative risk 1.10, 95%CI 0.96-1.27) [De Boer 2011[361]].
At 12 months Tamminga found that a multidisciplinary intervention (education and plan for gradual return to work) had no significant effect on complete return to work (hazard ratio 0.88, 95%CI 0.53-1.50), [Tamminga 2013[367]].
Two randomised studies reported effect on sick leave, which, in this overview, is regarded as a surrogate outcome measure for return to work. Björneklett found that a multidisciplinary intervention (information, relaxation, Qi-Gong and dance) had no effect on sick leave at 2, 6 and 12 months (p=0.853, 0.599 and 0.783, respectively) [Björneklett 2013[359]].Hubbard found that vocational rehabilitation had no significant effect at 6 and 12 months (average difference 53.1 and 2.0, respectively) [Hubbard 2013[363]].

*Partial return to work (crucial outcome measure)*
At 12 months Tamminga found that a multidisciplinary intervention (education and plan for gradual return to work) had no significant effect on complete return to work (hazard ratio 1.03, 95%CI 0.64-1.60), [Tamminga 2013[367]].

*Job satisfaction (crucial outcome measure)*
None of the randomised studies reported on the effect of job satisfaction.

*Loss of work (crucial outcome measure)*
Two randomised studies reported on the effect of loss of work, however, no statistics were given. Hubbard found no loss of work in the intervention group (vocational rehabilitation) or control group (usual care) [Hubbard 2013[363]]. Tamminga reported loss of work in 6.2% of the intervention group (multidisciplinary intervention with education and plan for gradual return to work) versus 7.4% in the control group (usual care) [Tamminga 2013[367]].

*Self-efficacy (crucial outcome measure)*
None of the randomised studies reported on the effect on self-efficacy.

Desired effects
On the basis of the literature study, no evidence was found for desired effects of interventions focused on work during and after completion of cancer treatment with curative intent, on participation in employment, quality of life, meaningful activities of daily living, fatigue and cognitive functioning.

Undesired effects
On the basis of the literature study, no evidence was found for undesired effects of interventions focused on work during and after completion of treatment of cancer with curative intent, on participation in employment, quality of life, meaningful activities of daily living, fatigue and cognitive functioning.

**Conclusions:**
Interventions during treatment with curative intent
The effect of interventions focused on work during treatment of cancer with curative intent on physical activity, activities of daily living, self-efficacy, cognitive function, quality of life and fatigue has not yet been studied in randomised studies.

There is some very low quality evidence that psycho-education, during treatment of cancer with curative intent, with or without telephone counselling, does not have an effect on work-related wellbeing compared with usual care.

There is some low quality evidence that multidisciplinary interventions during treatment of cancer with curative intent do not have any significant effect on return to work compared with usual care.

The general quality of evidence was low to very low.

Interventions after treatment with curative intent
The effect of interventions focused on work during treatment of cancer with curative intent on job satisfaction and self-efficacy has not yet been studied in randomised studies.

There is some low quality evidence that psychological interventions focused on work after completion of treatment of cancer with curative intent do not have any significant effect on physical activity, quality of life and return to work.

There is some very low quality evidence that physical interventions focused on work after completion of treatment of cancer with curative intent do not have any significant effect on quality of life and return to work.

There is some very low quality evidence that work-related interventions focused on work after completion of treatment with curative intent did not have any significant effect on physical activity, quality of life, sick leave and loss of work.

There is some low quality evidence that multidisciplinary interventions focused on work after completion of treatment of cancer with curative intent do not have any significant effect on physical activity, quality of life and return to work.

There is some very low quality evidence that multidisciplinary interventions focused on work after completion of treatment of cancer with curative intent did not have any significant effect on sick leave and loss of work.

The general quality of evidence was low to very low.

**Considerations:**
**Introduction**
Keeping a job and returning to the workplace are becoming increasingly more important to people who have been treated for cancer. Society is increasingly demanding that people continue to participate in society after their treatment for cancer. For this reason, oncological vocational rehabilitation is a logical and very promising addition to the arsenal of rehabilitation medicine interventions. Two groups of interventions can be distinguished within oncological vocational rehabilitation:

- interventions during treatment
- interventions when treatment has been completed

In order to arrive at a conclusion on the evidence from these interventions, a systematic review of the literature was carried out. The aim was to quantify the effectiveness of the various interventions. To do this, pre-defined outcome measures were used; these included return to work, job satisfaction, work-related wellbeing, self-efficacy, physical activity, activities of daily living, cognitive functioning, quality of life and fatigue.

In searching for and summarising the evidence on the effect of interventions focused on participation in work only controlled comparative studies were included. The consequence is that some of the sources of the Blueprint Cancer and Work 2009 and of the first version of the Guideline on Cancer Rehabilitation 2011 do not meet the inclusion criteria of this guideline (see guideline Blueprint Cancer and Work and Cancer Rehabilitation).

The table below was used to determine the strength of the recommendations.
Currently, there is a great deal of high quality research taking place, and it is expected that within a few years there will be sufficient evidence to formulate a recommendation.
**TABLE: From evidence to recommendation: factors to determine the strength of recommendations**

| Quality of the evidence | Low/very low | | |
|---|---|---|---|
| | Decision[1] | Further information | |
| **1. Quality of the evidence**<br>Is the general quality of evidence high?Comment from development group: There are still very few randomised controlled studies in this area. The few studies that are available are generally pilot studies of very modest size. This means that the quality of the evidence found and summarised is low.<br><br>Comment from development group: It can be stated with some caution that sufficient functional (physical and mental) capacity and skills are conditional for successful participation in the work process. It is feasible that interventions aimed at increasing specific aspects of functional capacity or skills that are important to work may contribute positively to the reintegration into work of patients who fall | yes<br>X no or unclear | … | |

| | | | |
|---|---|---|---|
| short of this. In contrast with an intervention for everyone, this is then real tailored care. | | | |
| **2. Balance between desired and undesired effects**<br>Do the *favourable* effects outweigh the *unfavourable* effects or do the *unfavourable* effects considerably outweigh the *favourable* effects, and is the development group certain of this?<br><br>Comment from development group: See remarks above. At this time, there is still too little available evidence to make a pronouncement on the favourable and unfavourable effects of intervention in the area of oncological vocational rehabilitation. | yes<br>X no or unclear | … | |
| **3. The patient's perspective**<br>Do nearly all patients have the same perspective on the *desirability* or the *undesirability* of the intervention they are offered?<br><br>Comment from development group: The desirability of interventions from the perspective of the patient, is far ahead of scientific research. At this time, many patients and care providers are experimenting with interventions that have not yet been evaluated. Patient associations are stimulating and endorsing the importance of continuing to experiment with these interventions.<br><br>Comments from patient representatives:<br>It is important to keep in contact with work during treatment. It is in the interest of the patient to regularly visit their workplace. However, patients should be aware that regularly 'showing your face' during sick leave may also be perceived as meaning they are no longer so ill. Remarks such as 'well you can get here' and 'you are looking alright' may indicate that their co-workers think they are well enough to return to work (or work more).<br><br>It is sometimes helpful to bring in a third party who can help make having cancer and its consequences at the workplace a topic of discussion (Cancer and Work).<br>Advise the patient on when they can begin therapeutic work. Even if it is just 2 hours a week. Advise the patient to start off with light and enjoyable duties. Gradually build these up and have the occupational health physician also look at the workload.<br>Create awareness in the patient that there is more than just work, they should be able to look after themselves and their family (if they have one). Social contacts outside work should also | yes<br>X no or unclear | … | |

| | | |
|---|---|---|
| be maintained.<br><br>Have the patient meet regularly with his/her direct line manager to evaluate the situation; advise them to look at how to work on this together.<br><br>Patients indicate that it is sometimes quite difficult to take a professional attitude, especially in the early phases. On one hand they sometimes tend to put too much into perspective in situations where colleagues and/or clients/patients present certain matters as being very important. On the other hand, they sometimes overreact to remarks or situations that evoke emotions. During this period counselling may be helpful, perhaps from a peer advisor. | | |
| **4. The professionals' perspective**<br>Do nearly all care providers have the same perspective on the desirability or the undesirability of the intervention they are offering?<br><br>Recent scientific studies, including Tamminga (2010), show there is added benefit from other care professionals and occupational health physicians when it comes to advice concerning return to work. Of course, the occupational health physician fulfils a specific role. This is laid down in Dutch law in The Eligibility for Permanent Incapacity Benefit (Restrictions) Act (*Wet Verbetering Poortwachter*). An insurance physician also fulfils a specific role. He/she is responsible for evaluation in terms of the Work and Income (Capacity for Work) Act (*Wet Werk en Inkomen naar Arbeidsvermogen (WIA)*). | Yes<br>X no or unclear | … |
| Strenght of recommendation | weak (conditionally) | |

# Cost-effectiveness

**Recommendations:**
**Key question**
Is interdisciplinary specialised medical rehabilitation care and its associated individually-delivered interventions cost-effective in patients with cancer?

**Recommendation**
The development group has reached the consensus that the heterogeneity of the studies investigated and their conflicting findings do not permit any general pronouncements concerning the cost-effectiveness of interdisciplinary specialised medical rehabilitation in oncology in comparison with standard care in patients with cancer. More research into the cost-effectiveness of multidisciplinary and interdisciplinary and multimodal specialised medical rehabilitation interventions in people with cancer is necessary. This applies to all phases of treatment, and therefore both during and after completion of treatment with curative intent and at the palliative phase.

**Literature review:**
**Summary of the literature**

Rationale
In accordance with recommendations from the Netherlands National Health Care Institute, specialised medical rehabilitation in oncology is included in the basic health care insurance package. In order to achieve wider societal acceptance, interventions must not only be effective but also cost-effective, i.e. health benefits must be attained at an acceptable extra cost. A literature study was carried out in order to make a pronouncement on the cost-effectiveness of psychosocial or physical interventions as part of a multimodal interdisciplinary specialised medical rehabilitation programme in oncology. The literature was searched for complete economic evaluations, i.e. studies that integrate differences in costs and differences in health between treatment groups into one outcome measure – the cost per unit of health effect. In general the Quality Adjusted Life Year (QALY) was used for unit of health effect. However, health effects can also be expressed as improvements in more disease-specific measures, such as fatigue or return to work. Health effects expressed as QALYs have an advantage in that interventions can be easily compared with one another and that cost-effectiveness can be measured at a reference point. Although in the Netherlands there is no fixed reference point, sums varying from €20,000 to € 80,000 per QALY are generally regarded as cost-effective; the higher threshold value is only for conditions in which the burden of disease is extremely heavy.
A systematic review that complies with the Cochrane criteria has not yet been published. Those cost-effectiveness studies that have been reported on so far (a total of ten studies described in eleven articles) are written from varying perspectives and the oncological population, interventions studied and the length of follow-up period are heterogeneous. These cost-effectiveness studies are mostly based on underlying clinical studies which, in general, are at high risk of bias. The heterogeneous palette of studies resulted in a whole range of conclusions; some studies described their chosen intervention as being more effective and cheaper than standard care. Other studies conclude that the intervention was more expensive and no better than standard care. Therefore, it is not possible to make a general pronouncement based on published studies. More qualitatively good research is necessary.
A recent qualitative descriptive review carried out by Mewes [Mewes 2012[382]] identified six cost effectiveness studies that were published between 1 January 2004 and 1 June 2012. In order to find if any studies had been published more recently, we conducted an additional literature search into economic evaluations of interventions aimed at reducing psychosocial or physical symptoms in cancer patients in the English, Dutch, German, French, Italian and Spanish languages published between 1 January 2012 and 1 January 2015.

Description of studies
In a review, Mewes [Mewes 2012[382]] described six cost-effectiveness studies. One of these studies, a multimodal intervention was compared with standard care [Gordon 2005[375]]. This study was also described in the 2010 guideline. In all the other studies, only one possible component of interdisciplinary specialised medical rehabilitation specifically aimed at the improvement of psychosocial or physical problems in the patient with cancer was examined, two studies evaluated exercise interventions [Haines 2010[376], Retel 2011[384]] and three evaluated psychosocial interventions [Lemieux 2006[379], Mandelblatt 2008[380], Sabariego

2011[386]. As two of these six studies made no comparisons with standard care [Haines 2010[396], Sabariego 2011[406]], but instead compared two interventions, these studies were consequently excluded. Four studies from the review of Mewes [Mewes 2012[382]] were included in this review. Due to the limited number of studies into multimodal interventions, studies that focused on only one potential part of interdisciplinary specialised medical rehabilitation were also included.

The additional literature study resulted in a total of seven articles containing six unique cost-effectiveness studies [Arving 2014[369], Farquhar 2014[374], Hollingworth 2013[377], Jones 2013[378], Mewes 2014[381], Mourgues 2014[383], Round 2014[385]]. Four of these studies (described in five articles) evaluated multimodal interventions [Farquhar 2014[374], Jones 2013[378], Mewes 2014[381], Mourgues 2014[383], Round 2014[385]] and two others evaluated psychosocial interventions [Arving 2014[369], Hollingworth 2013[377]]. Jones [Jones 2013[378]] and Round [Round 2014[385]] described the same clinical trial. A total of ten cost-effectiveness studies were reviewed: four from Mewes' review [Mewes 2012[382]] and six from the additional literature search. With the exception of the studies of Farquhar [Farquhar 2014[394]], Jones [Jones 2013[378]] and Round [Round 2014[385]], all the studies were aimed at patients who were, in principle, being treated with curative intent.

Multimodal interventions

A British cost-effectiveness study was carried out on a two-week intervention which was aimed at breathlessness in patients with advanced tumours. In an RCT, 67 patients either took part in the "Breathlessness Intervention Service"(BIS) or they were put on a waiting list (and had the intervention after two weeks anyway). The goal of the BIS programme was to give patients more control over their breathing and in this way to prevent distress for patients and their informal carers. The target group comprised patients with very advanced tumours and breathlessness, who were expected to benefit from a self-management programme. The BIS programme was individually tailored and compiled from multidisciplinary interventions, including pharmacological interventions, and lasted for a period of two weeks. Patients had one to four consultations in their own homes, and four to six telephone conversations with a member of the BIS team comprising a palliative physician, an occupational therapist and a physiotherapist. Amongst other things, the programme comprised the following interventions: information, breathing exercises, physical exercises, psychological support, lifestyle changes, relaxation exercises, dietary advice, sleep exercises, support from the family, short-term cognitive therapy, a pharmacological consultation sometimes combined with low doses of opiates, antidepressants or anxiolytics. In more complex problems, referrals to more specialised help were made. The main outcome measures of fifty-seven patients were calculated. The intervention group had significantly fewer problems with breathlessness than the group who got standard care (p=0.049).

The intervention resulted in a benefit in QALY of 0.0002 and reduced costs (medical and non-medical) by £354 per patient between the start of the BIS programme and the time point at the end of two weeks. However, the 0.0002 benefit in QALY was not clinically relevant, although this could be due to the short period of intervention. [Farquhar 2014[394]].

A French study was carried out in which patients who were treated for primary breast cancer were randomised to either no intervention or to a two-week stay at a health spa for intensive multimodal physical intervention combined with dietary advice. Both groups received dietary advice from a dietician at six months and twelve months. The aim of the intervention was that the patients should resume their working lives and social activities more quickly than normal. In addition, the cost-effectiveness of the intervention was measured. The target group comprised patients who had completed treatment for primary breast cancer <9 months beforehand, had no metastases, no contraindications to physical exertion, no cognitive disorders and a BMI of between 18.5 and 40kg/m$^2$. The two-week intervention comprised daily two-hour sessions of varied physical exercise supervised by a physiotherapist, consultations with physicians, psychologists and dieticians, aesthetic treatment, thermal baths and massages, customised meals and nutritional information [Mourgues 2014[403]]. The outcome measures were resumption of work, resumption of social activities and the ability to carry out activities of daily living.

A cost-effectiveness analysis was carried out on 90 patients. After 12 months, resumption of activities was better in women in the intervention group than in the control group (p=0.0025). Where return to work was concerned, the intervention was much more effective (p=0.0014). At 12 months, the total cost of the intervention group was a few hundred Euro higher. For this reason, the authors regard the intervention as being cost-effective. However, the extent to which society is prepared to pay for return to work is unknown, meaning it is difficult to make an assessment of the cost-effectiveness of this intervention [1] [Mourgues

2014[403]].

A British study examined the cost-effectiveness of a multimodal intervention in patients with an active form of breast cancer or haematological malignancy who had finished their treatment but who were at high risk of a recurrence of their disease. The intervention comprised a multidisciplinary group of activities including physiotherapy and psychosocial counselling. It was given at the day care unit of a hospice. People in the control group were put on a waiting list and also received the intervention three months later. The programme was individually tailored to each participant. After intake with a senior nurse, at which time the National Assessment and Care Planning Framework was used, the aim of the rehabilitation trajectory was determined and arrangements about the intensity were made at an individual level. Patients were discussed at a weekly meeting of a multidisciplinary team. At this time the patient's progress was discussed and if necessary supplementary treatments indicated. These included acupuncture, art therapy, Bach flower therapy, family therapy, homeopathy, massage, hypnotherapy, foot reflexology therapy and relaxation therapy. The patient's progress was also discussed with the treating specialist, and extra treatment goals were sometimes also determined at this time. There were a total of 41 participating patients and 36 were able to complete the three-month period. After three months, the intervention group showed significant improvement in psychosocial needs and Quality Adjusted Life Years.

The study showed that this intervention leads to a substantial gain in QALYs, i.e. 0.052 QALY at three months. From the health care perspective, the cost-effectiveness ratio was under £20,000/QALY, which in the United Kingdom is regarded as being cost-effective. [Jones 2013[398], Round 2014[385]]

An Australian cost-effectiveness study in patients treated for primary breast cancer included two interventions (DAART and STRETCH) which were compared with standard care. The aim of both interventions was to support patients after surgery for breast cancer by building up the strength and flexibility in their upper body (shoulder mobility in particular), and also to offer practical and psychosocial help where necessary. The target group comprised English-speaking women with unilateral breast cancer, no cognitive problems and who were aged between 25 and 74 years-old. DAART comprised physiotherapy and tailored education in order to carry out a programme of home-based exercises. The DAART programme was given in an average of three individual sessions of one hour per patient over a period of a maximum of six weeks. STRETCH was a group programme led by exercise physiologist and comprised physical exercises, education, group discussions of psychosocial problems and contact with fellow patients. The STRETCH programme comprised one session of one to two hours a week over a period of eight weeks. Thirty-six people participated in DAART, and 31 in STRETCH. These groups were compared with a non-intervention group of 208 people. The number of 'rehabilitated' people in the DAART and STRETCH groups was equal, but in the control group, this number was slightly higher.

When used as an outcome measure in QALY, the QALY benefits of both interventions were higher than those achieved by standard care. With its costs per QALY ratio of $1,344, due to lower costs per QALY the DAART intervention was more cost-effective than the STRETCH intervention (costs per QALY $14,478). Set against the available Australian budget of $30,000 per QALY, both were regarded as cost-effective.

A Dutch modelling study used data from a four-armed RCT comprising cognitive behavioural therapy (CBT), physical exercise (PE), the combination of CBT and PE, and a waiting list control group. This study was carried out in patients with primary breast cancer who, due to treatment, had developed serious menopausal symptoms. The interventions were intended to help them to cope better with the menopausal symptoms. On comparison with standard care, PE led to a significant decrease in endocrine and urinary symptoms and improvement of physical activity. CBT led to a significant reduction of hot flushes and night sweats and improved sexual activity. The combination of interventions did not result in any more health benefits than the single interventions. The cost-effectiveness study involved each of the interventions and the WLC. The CBT intervention comprised six meetings of six to eight participants, each lasting one-and-a-half hours, with a "booster" meeting six weeks after the programme finished. The PE intervention lasted for twelve weeks and comprised an intake interview with a physiotherapist who prescribed a programme of exercise tailored to the patient. The first contact lasted one-and-a-half hours and took place at a clinic. At this time, a tailored programme aimed at exercising independently at home for two-and-a-half to three hours a week was put together. This was followed by two telephone calls of about fifteen minutes each in weeks four and eight, and then another appointment at the clinic lasting for one hour. The participants were also given a heart rate monitor and instructions on how to use it. If they wanted to, patients were able to have a telephone consultation with their physiotherapist each week. At a twelve-week follow-up appointment after the end of the programme, the best way for the patient to remain

physically active was discussed.

As an effectiveness study showed that the QALY benefit was comparable in all three intervention groups, but the costs of CBT + PE were higher than CBT or PE, CBT + PE were excluded from the cost-effectiveness analysis. At six months, and from the perspective of health care, the CBT intervention was the most cost-effective, with a cost-effectiveness ratio of €22,500 per QALY on comparison with standard care. The cost-effectiveness ratio of the PE intervention was slightly less favourable, i.e. cost-effectiveness ratio at € 28,078 per QALY. If the cut-off point per QALY is set at €20,000, the authors are of the opinion that neither of the unimodal interventions can be regarded as truly cost-effective [Mewes 2014[401]].

Physical training

A modelling study carried out in the Netherlands examined the cost-effectiveness of swallowing exercises prior to chemoradiation in patients with extensive head and neck cancer (phases III and IV). The intervention was intended to reduce swallowing problems after treatment and to shorten the time of dependence on tube feeding. The intervention comprised stretching and strengthening exercises for the masticator muscles which had to be done three times a day. This was compared with standard care, i.e. no special intervention. Patients were followed up to one year after inclusion. In the intervention group (n=37), 3% of the patients remained dependent on tube feeding, while in the standard care group (n=53), 25% were still dependent on tube feeding.

From the perspective of health care, the intervention was cost-effective, with a high QALY benefit of 0.09 associated with extra costs of €285 per patient. With its cost-effectiveness ratio of €3,197 per QALY, in the Netherlands this intervention is regarded as being extremely cost-effective [Retel 2011[404]].

Psychosocial interventions

A Swedish cost-effectiveness study coupled with a three-armed RCT of 168 patients with primary breast cancer showed that a psychosocial intervention offered by a psychologist or specially trained nurses was better and cheaper than standard care. The intervention was intended to reduce psychological problems and improve quality of life. The target group comprised patients who had been diagnosed with breast cancer shortly before treatment. The intervention comprised complementary psychosocial care given by specially trained oncology nurses (INS group) or by a psychologist (IPS group). The comparative treatment was standard care (SC group), but should it be necessary the patient could be referred for social support. Each intervention arm used various methods, including CBT, relaxation exercises and an activity scheduler. The number of sessions per patient varied between one and 23, and contact took place both in the clinic and by telephone. The results of the interventions were measured over a period of two years. When compared with the SC group, both arms were found to be equally effective and had resulted lower anxiety levels, a better health-related quality of life and patient satisfaction.

Each of the interventions was better and cheaper than SC. The intervention given by psychologists delivered the most benefit in QALYs (0.16 on comparison with SC), compared with 0.09 per QALY in the group led by the nurses. The additional psychosocial care in this study, was both better and cheaper than SC [Arving 2014[369]].

A Canadian cost-effectiveness study was carried out on patients with metastasised breast cancer who, in addition to SC, were randomised (2:1) to a weekly group meeting of 90 minutes with fellow patients under the guidance of a therapist. Survival, pain, psychosocial functioning and health-related quality of life were evaluated. The intervention comprised supportive, expressive, psychological group therapy lasting 90 minutes. The groups comprised eight to twelve women and two counsellors. The counsellors were psychotherapists, psychologists, socials workers or nurses who had experience in leading groups. At least one of the two counsellors was a woman. At median follow-up of 722 and 750 days, respectively, there was no difference in survival but the intervention group reported significantly less pain and less anxiety.

The costs per single unit of anxiety in the Profile of Mood States questionnaire were $5,550 Canadian dollars per patient. The cost of a single unit less pain measured on the Visual Analog Scale was $4,309. As unlike using QALY as an outcome measure, it is not clear what the available budget for this health benefit is, it is difficult to say if these interventions can be regarded as cost-effective [Lemieux 2006[379]].

An American cost-effectiveness study was carried out in 389 patients with primary breast cancer. They participated in a three-armed RCT aimed at psycho-education to improve the transition from active

treatment to recovery from cancer (survivorship). Three methods were applied: written information only, written information combined with a video ("Moving beyond Cancer"), both these methods with counselling comprising one session of personal contact (80 minutes) and after two weeks, one 30-minute telephone session. During these sessions, cancer-related problems in four domains of life were discussed, i.e. physical health, emotional wellbeing, interpersonal relationships and perspectives on life. In addition, the most important problems and help needs of the patients were identified and became the goals for developing the rehabilitation plan of action.

At six-month follow-up the most extensive intervention was no more effective in increasing energy levels or reducing psychosocial problems than the other two groups, but it was more expensive [Mandelblatt 2008[400]].

In a British cost-effectiveness study including 209 patients, shortly after the start of radiotherapy or chemotherapy an intervention was - or was not - offered to evaluate its effect on the improvement of psychological wellbeing, health-related quality of life, satisfaction with care and reduced care costs. The intervention comprised the filling in of the Distress Thermometer (DT) & Problem list (PL) in the second week of chemotherapy or during the second cycle of chemotherapy by a specially trained radiographer or nurse in order to make an inventory of the problems and discuss them. In addition, patients were stimulated to look for help themselves. Referral to care providers was not the primary aim. If the patient wished, the DT&PL session could be repeated at the end of treatment. All the participating patients had been diagnosed with cancer less than 12 months previously. The questionnaires were filled in at one, six and twelve months.

On comparison with SC (no intervention) the intervention group did not differ significantly on questions of quality of life and mood. As the intervention group incurred higher costs, this intervention is not cost-effective [Hollingworth 2013[397]].

[1] A complete economic evaluation, such as selected for this review, may use QALYS to measure effects, however, other tools for measuring effects may also be used. The disadvantage of expression in clinical effectiveness measures is that economic evaluation studies are not mutually comparable, and that the budgets available for improved clinical effects are generally unknown.

**Conclusions:**
Ten studies were found which are heterogeneous concerning type of cancer patient, type of intervention and the duration and intensity of the intervention. This heterogeneity makes it difficult to make generally applicable pronouncements about the cost-effectiveness of these interventions. For this this reason, the studies will be individually described and a conclusion will be drawn for each of them.

There are indications that a short-lasting multidisciplinary programme aimed at the improvement of breathlessness in patients with very advanced tumours (including self-management) leads to lower costs and is at least as good as standard care for these patients.
Level 3: B [Bjorneklett 2013[390]]

There are indications that following treatment for primary breast cancer, an intensive programme for patients comprising a combination a two-week stay at a health spa and dietary advice after leaving, leads to a better level of activity and a more rapid return to work. This intervention was more expensive than standard care, however, its cost-effectiveness has not been studied.
Level 3: B [Mourgues 2014[383]]

There are indications that a tailored outpatient multimodal intervention (focused on physical, psychological, social, financial, emotional and/or spiritual problems) for patients who had recently completed treatment for an active form of breast cancer or haematological malignancy and who were more likely to recover from the disease, is cost-effective. The intervention comprised partially of components, the efficacy of which cannot automatically be accepted.
Level 3: B [Jones 2013[398], Round 2014[405]]

There are indications that both an individual unimodal intervention focused on physical training and a multimodal group intervention focused on physical training, education and psychosocial support for patients

treated for primary breast cancer are cost-effective.
Level 3: B [Gordon 2005[395]]

There are indications that both physical training and CBT, and the combination of these interventions when focused on patients with primary breast cancer who have developed menopausal symptoms due to treatment, lead to an improved quality of life. However, seen against the backdrop of the standards that apply in the Netherlands, these interventions are scarcely, or not at all, cost-effective.
Level 3: B [Mewes 2014[401]]

There are indications that an intervention comprising stretching and strengthening exercises of the masticator muscles which aimed at reducing both swallowing problems and dependency on tube feeding following chemoradiation for extensive head and neck carcinoma, is cost-effective on comparison with standard care.
Level 3: B [Retel 2011[404]]

There are indications that a psychosocial intervention given to patients with newly-diagnosed breast cancer by a specially trained oncology nurse or a psychologist is both better and cheaper than standard care.
Level 3: B [Arving 2014[389]]

There are indications that a group intervention focused on psychosocial support for patients with metastasised breast cancer leads to a reduction in pain and anxiety. The intervention is more expensive than standard care. No pronouncements on cost-effectiveness have been made.
Level 3: B [Lemieux 2006[399]]

There are indications that a psychological intervention comprising the provision of informational materials and personal counselling which is focused on the transition from active treatment for primary breast cancer to recovery from cancer, are more expensive but no more effective than informational materials alone.
Level 3: B [Mandelblatt 2008[400]]

There are indications that the filling in and discussing of the Distress Thermometer and Problem List in order to reduce psychological unrest and emotional problems during treatment in patients who have recently been diagnosed with cancer, is more expensive, but no better, than standard care.
Level 3: B [Hollingworth 2013[397]]

**Considerations:**
The ten studies retrieved are heterogeneous in the following aspects:

- Type of cancer. Many studies are aimed at breast cancer patients, but there are also studies that do not differentiate between types of cancer.
- The clinical problem at which the intervention is primarily aimed, e.g. respiratory problems or menopausal symptoms caused by cancer therapy.
- The phase of the disease: most studies are aimed at the planned curative phase, while other studies intervene only at the palliative phase.
- The varying components of treatment. Here too, a broad spectrum of interventions were found varying from dietary interventions, exercise interventions and behavioural therapeutic interventions to wellness interventions.
- The intensity of the intervention, short or long interventions.
- The composition of the group – individual interventions, group interventions or a combination of these.

This heterogeneity makes it difficult to make generally applicable pronouncements about the cost-effectiveness of interdisciplinary specialised medical rehabilitation interventions.

Three studies [Bjorneklett 2013[390], Bradley 2013[391], Tamminga 2013[408]] were excluded from the answering of the key question, as a complete economic evaluation is lacking. These studies did not describe any effects on health, rather they only included the economic effects, e.g. care consumption or return to paid work. Despite the fact that effects on health were not included, these studies did deliver relevant insights into the economic effects of the intervention. The results of these three studies also contribute to the general picture of contradictory results that is described above. Two studies reported higher costs in the

intervention group [Bjorneklett 2013[390], Tamminga 2013[408]], while the third study [Bradley 2013[391]] calculated that the costs in the intervention group were actually lower.

Because in the literature study information was found about ongoing randomised studies of both uni- and multimodal interventions aimed at the improvement of psychosocial or physical problems in the patient with cancer, it can be assumed that in the near future new information will become available on the cost-effectiveness of both unimodal and multimodal interventions aimed at the improvement of psychosocial and physical problems in the patient with cancer.

Despite the fact that the cost-effectiveness of interventions aimed at the improvement of psychosocial and physical problems in the patient with cancer is still unknown, it can be assumed that some interventions will be cost-effective. It has been shown that exercise interventions given during and after treatment with curative intent reduce chronic fatigue and improve quality of life, but the cost-effectiveness of uptake of care over the long-term or returning to a working life has not yet been calculated.

**Knowledge gaps**

The cost-effectiveness of multimodal interventions and interdisciplinary specialised medical rehabilitation in oncology aimed at the improvement of psychosocial and physical problems in the patient with cancer is still unknown. Research comparing this approach with monodisciplinary interventions and with standard care is still necessary.

# Organisation of care

**Recommendations:**
**Key question**
What is the best way of organising care around specialised medical rehabilitation in oncology and recovery of patients with an oncological condition?

**Recommendations**
Screening by primary treating professional and referral to Specialised Medical Rehabilitation in oncology (see General Module Sreening).
The guideline development group has come to the consensus that both during and after completion of treatment of cancer with curative intent, and in the palliative phase (disease and symptom-oriented), it is desirable to use a specific instrument to screen for distress and care needs, and to discuss the outcomes with the patient. In choosing an identification instrument, the guideline development group has followed the choice of the most recent version of Guideline on Screening for Psychological Distress (richtlijn Detecteren behoefte psychosociale zorg). The current version of the Guideline on Screening for Psychological Distress (Detecteren behoefte psychosociale zorg) advises using the Distress Thermometer (de Lastmeter) as an instrument for identifying, screening and monitoring, and the Distress Thermometer (de Lastmeter) in which if patients answer 'yes' to having a problem, they are then able to indicate the severity of that problem on a scale of 1 to 10. The EORTC-QLQ-C30 can also be used for monitoring.

The guideline development group has come to the consensus that when multiple problems and a request for help arise, the inter-relation and complexity should be determined prior to being able to give information and/or to refer to the care of one or more psychosocial and/or paramedical disciplines or for coordinated interdisciplinary specialised medical rehabilitation.

If there is doubt about the degree of complexity or inter-relatedness and where the best place to refer a patient would be, a rehabilitation physician, paramedic or psychosocial service provider can be consulted. The rehabilitation physician, paramedic or psychosocial service provider can then advise on the best place to refer the patient, if necessary within their particular network, and report this to the referrer.

The guideline development group has come to the consensus that the Verwijsgids Kanker can be used to find supportive treatment and guidance for the cancer patient, including specialised medical rehabilitation treatment in oncology and providers of monodisciplinary care.

Integrated care and collaboration with primary and secundary care
The guideline development group has come to the consensus that the formation of a collaborative partnership with primary and secondary care providers of additional care is of great importance in order to be able to offer tailored care as near to home as possible, but also further away if it should be necessary.

Intake for Specialised Medical Rehabilitation in Oncology (see MSR decision tree)
The guideline development group has come to the consensus that on indication of complex, multiple inter-related problems of functioning resulting from cancer or its treatment, that prior to referral it should first be determined if interdisciplinary specialised medical rehabilitation treatment by a rehabilitation physician with expertise in oncology is a possibility. On direct or self-referral to paramedical healthcare providers and direct referral to psychosocial service providers, then these healthcare providers should first consider the desirability of interdisciplinary specialised medical rehabilitation in oncology as part of their specific professional intake.

The guideline development group has come to the consensus that a rehabilitation physician with expertise in the field of oncology should determine if specialised medical rehabilitation in oncology is a suitable intervention for the patient, if the patient has been referred for inter-related and complex problems of functioning resulting from cancer or its treatment by the primary oncological treating professional (i.e. internist-oncologists, oncological surgeons, oncological radiologists, nurses, nurse specialists, physician's assistants, general practitioners and occupational health physicians). If there is no indication for specialised medical rehabilitation in oncology, then, should the patient wish it, the rehabilitation physician should refer the patient back to the referring party with advice for monodisciplinary treatment (potentially combined) (see MSR decision tree).

Rehabilitation plan (see MSR decision tree).
The guideline development group has come to the consensus that the plan for specialised medical rehabilitation in oncology should include appropriate interventions focused on optimal functioning/participation, and take into account the wishes and limitations of the patient.

Role of rehabilitation physician
The guideline development group has come to the consensus that the rehabilitation physician should play a coordinating role in the development and implementation of the specialised medical rehabilitation plan. In some cases, the rehabilitation physician may act as a consultant.

The guideline development group has come to the consensus that the rehabilitation physician should regularly provide feedback on the effects of rehabilitation treatment to the referring professional, and if this is not the general practitioner, to the general practitioner as well.

The empowerment role of the patient
The development group has come to the consensus that if a patient has a feeling of autonomy and control that this will contribute to the success of specialised medical rehabilitation in oncology. Joint goals will be drawn up in accordance with the principles of shared decision making and patient empowerment (see Empowerment module).

Framework of treatment and position
The development group is of the opinion that specialised medical rehabilitation in oncology must comply with the framework of treatment of the Netherlands Society of Rehabilitation Medicine (NSRM) and the position of The Netherlands National Health Care Institute on specialised medical rehabilitation.

Geriatric rehabilitation care
The development group has reached the consensus that on discharge from hospital, vulnerable, mainly elderly, patients with cancer, who are too vulnerable to be discharged home, should be considered for clinical multidisciplinary cancer rehabilitation in geriatric rehabilitation care (GRC). The aim of GRC is for the patient to be able function at home again and to be able to move around and take care of themselves. Following triage by a specialist elderly care physician, the treating physician makes the referral from the clinic.

**Literature review:**
**Summary of the literature**
The development group has decided not to carry out a systematic literature search, as on the basis of expertise, it expects there to be a lack of literature to answer this question.

**Conclusions:**
The development group has decided not to carry out a systematic literature search as, on the basis of expertise, it expects there to be a lack of literature to answer this question.

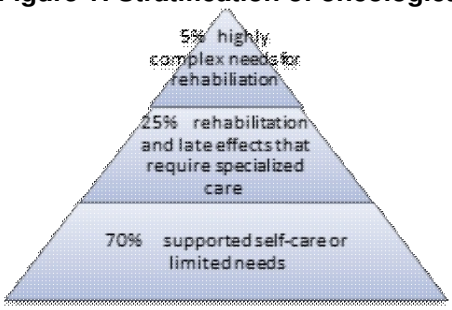
**Considerations:**
Problems on the physical, cognitive, emotional or social levels, and/or relating to role functioning and/or life orientation resulting from having, or having had, cancer and its treatment, are encountered in daily oncological practice. After they have been identified and discussed, these problems may result in referral of the patient in question. This may be referral for monodisciplinary treatment, but in the event of various inter-related and complex problems of functioning, referral to specialised medical rehabilitation in oncology may be necessary (see Decision tree MSR). The treatment of cancer involves several phases for which a number of different healthcare professionals are responsible. In disease-oriented treatment, the main treatment will usually be given in secondary care or tertiary clinics under the supervision of a medical specialist; symptom-oriented treatment will generally be managed both in secondary and primary care (general practitioner). During both phases of treatment (often one gradually merges into the other), the aid of several healthcare professionals is sought for their specific expertise in a particular area.

Both during and after completion of cancer treatment with curative intent, and in the palliative phase (disease and symptom-oriented), it is desirable to use a specific instrument to screen for distress and care

needs, and to discuss the outcomes with the patient. In choosing an identification instrument, the development group advises following the most recent version of Guideline on Screening for Psychological Distress. The current version of the Guideline on Screening for Psychological Distress advises using the Distress Thermometer (de Lastmeter) as an instrument for identifying, screening and monitoring and the Distress Thermometer in which if patients answer 'yes' to having a problem, they are then able to indicate the severity of that problem on a scale of 1 to 10. The EORTC-QLQ-C30 can also be used for monitoring.

Screening and potential referral should be part of tumour-specific guidelines and care pathways in accordance with generic template for a care path for people with cancer (IKNL). Not all patients with cancer require specialised follow-up treatment such as specialised medical rehabilitation in oncology. Most cancer follow-up care is self-management (IKNL, 2011). Stratification to care need and indication is important (matched care) (see Figure 1) [DCS, 2010[393]]. The majority of cancer patients (approximately 70%), appear to be able to manage their recovery with basic care and with advice and counselling on self-management. A smaller proportion (± 25%) require specialised monodisciplinary care or concurrent care from a number of monodisciplinary healthcare professionals (with both single and multiple problems that are not inter-related). A small minority of patients with cancer (~ 5%) have multiple, inter-related and complex problems which require specialised medical oncological rehabilitation. On the basis of the 2016 cancer incidence of 108,400, it is estimated that 25,000 people with cancer need either monodisciplinary care or a number of concurrent monodisciplinary treatments, and 5,000 patients require interdisciplinary specialised medical oncological rehabilitation care.

**Figure 1: Stratification of oncological follow-up care** (source: The Danish Cancer Society)




Collaboration between primary and secondary providers of supportive care is of the greatest importance in order to provide optimal care as close to home as possible. Cancer care providers are working to create Comprehensive Cancer Networks (CCNs). In the future it is hoped that providers of additional care and counselling will join a CCN (Koersboek Netwerkvorming).

A rehabilitation physician can also be consulted by institutions that do not have a local rehabilitation team. Should this consultation result in an indication for specialist oncological medical rehabilitation, the rehabilitation physician can then advise the facility or hospital rehabilitation department on where the specialised medical rehabilitation treatment can take place.

Screening and possible referral should be included in tumour-specific guidelines and care pathways (generic template for a care path for people with cancer (IKNL). The Verwijsgids Kanker can be used to ascertain referral possibilities in the region. The Verwijsgids Kanker is a digital guide that helps in finding expert supportive treatment and counselling resources for people with cancer. It covers care resources at both national and regional levels, including physiotherapy, psychosocial care, occupational therapy, dietary advice, skin therapy etc.

Description of specialised medical rehabilitation in oncology

Specialised medical rehabilitation is interdisciplinary treatment given on an outpatient basis which is focused on maximising the autonomy and participation of patients with diverse inter-related and complex problems of functioning as a consequence of having, or having had, cancer and of its treatment. These problems of functioning are at the physical, cognitive, emotional and/or social levels related to functioning in a role and/or life orientation.

Specialised medical rehabilitation falls within the area of expertise of rehabilitation medicine. This means that a rehabilitation physician decides who is eligible for coordinated interdisciplinary oncological rehabilitation care on the basis of patient needs, problems of functioning and the feasibility of the treatment goals. Specialised medical rehabilitation in oncology must comply with the framework of treatment of the Netherlands Society of Rehabilitation Medicine (NSRM) and the position taken by The Netherlands

National Health Care Institute on specialised medical rehabilitation.

If there is no indication for specialised medical rehabilitation in oncology the rehabilitation physician will refer the patient back to the referring professional, potentially with advice on treatment by one or more care providers.

The rehabilitation physician will play the coordinating role in the development and implementation of the specialised medical rehabilitation plan. In some cases, the rehabilitation physician can act as a consultant.

Specialised medical rehabilitation treatment in oncology takes place on an outpatient basis and is delivered by an interdisciplinary team of care professionals, coordinated by a rehabilitation physician. This excludes all other forms of care, such as care provided by one or more monodisciplinary health care professionals, even though the term rehabilitation is often used to describe these.

Target referral population
The Guideline on Specialised Medical Rehabilitation in Oncology is aimed at patients aged 18 years and older. This includes patients who are in the final phase of planned curative treatment or who have completed it, and those who are at the palliative phase of any oncological condition. Where the patients are in the palliative phase, the guideline focuses on disease-oriented and symptom-oriented problems, and explicitly not on the phase of terminal palliation (see module *In the Palliative Phase*).

Identifying and screening
For identifying and discussing symptoms, their consequences and the wish for referral both during and after completion of planned curative treatment for cancer, and during the disease- and symptom-oriented palliative phase, the instrument that should be used is found in the current version of the guideline Screening for psychological distress.

The current version of the Guideline on Screening for Psychological Distress advises using the Distress Thermometer (de Lastmeter) as an instrument for identifying, screening and monitoring and the Distress Thermometer in which if patients answer ‘yes’ to having a problem, they are then able to indicate the severity of that problem on a scale of 1 to 10, or use the EORTC-QLQ-C30 for monitoring.
When one or more problems and a request for help arise, their inter-relatedness and complexity should be determined prior to being able to refer to monodisciplinary treatment or coordinated interdisciplinary specialised rehabilitation in oncology.
The guideline development group has reached the consensus that the following is applicable to identification, discussion and referral:

- Problems and a wish for referral should be inventoried and discussed with the patient. In doing this, it is recommended that the Distress Thermometer be used (de Lastmeter).
- In the event of problems with functioning at multiple levels, i.e. physical, cognitive, emotional or social levels, and/or relating to role functioning and/or life orientation or if there is an increased risk of this, then inter-relatedness should be determined. On the basis of this, the coordinating rehabilitation physician makes a referral to specialised medical rehabilitation in oncology or to monodisciplinary treatment (which may be provided by multiple healthcare professionals from several disciplines).
- In the event of very extensive or severe disorders of function with permanent limitations, whereby the recovery process is expected to be prolonged or incomplete, then referral to outpatient or clinical specialised medical rehabilitation care is indicated.

Primary treating professional
Specialised medical rehabilitation in oncology falls within the area of expertise of rehabilitation medicine. This means that a rehabilitation physician decides who is eligible for coordinated interdisciplinary oncological rehabilitation care on the basis of patient needs, problems of functioning and the feasibility of the treatment goals.

The rehabilitation physician is the primary treating professional in specialised medical rehabilitation in oncology and plays a coordinating role in the development and implementation of the specialised medical rehabilitation plan.

Specialised medical rehabilitation treatment in oncology is delivered by an interdisciplinary team of care

professionals, coordinated by a rehabilitation physician who also gives guidance on organisation and content. The rehabilitation physician is either the care coordinator or appoints a care coordinator from within the interdisciplinary team.

Coordinator specialised medical rehabilitation in oncology
The development group has come to the consensus that during specialised medical oncological rehabilitation, it must be clear to the patient at all times who the coordinator of their treatment is.

Record-keeping
A structured intake interview should be taken by, or under the supervision of, a rehabilitation physician with expertise in the field of oncology. On asking the questions, the phase of the disease should be kept in mind (curative intent versus palliative). The following questions should be answered during a structured intake interview:

- Is there a limitation of, or a threat to, the exercise tolerance capacity in relation to the desired functioning?
- Is there an indication for the prevention or treatment of fatigue during treatment with curative intent or after it has been completed?
- Does the Distress Thermometer indicate emotional problems and/or does the patient need support in the psychological/emotional areas (Distress Thermometer), Center for Epidemiologic Studies Depression Scale, (CES-D≥ ≥16 )?
- Is there a disturbance of, or threat to, social functioning at work/in household tasks, relationships, social relationships, role in family and leisure activities on comparison with the situation prior to the disease?

The development group has reached the consensus that in making the decision on whether specialised medical rehabilitation in oncology is a suitable form of treatment, in consultation with the patient and other care providers and based on the intake process described the decision tree ’Specialised medical rehabilitation in oncology', the following should be observed:

- Goals of specialised medical rehabilitation in oncology should be formulated.
- Tailored treatment should be selected.
- At every phase of rehabilitation treatment and at every point in time, it should be clear to the relevant care professional exactly which specialised medical rehabilitation interventions are being deployed, who is involved in each treatment, and who the coordinator of specialised medical rehabilitation in oncology is. An interdisciplinary care record should be used for this purpose.

This interdisciplinary care record should preferably be electronic and should comprise:

1. Patient’s personal details.
2. Medical data such as diagnosis, previous and current treatment, co-morbidity, medication and allergies.
3. Current physical and mental functioning such as fitness level, pain, mobility, anxiety and depression.
4. Psychosocial data such as living environment, partner, informal carers, work.
5. Rehabilitation diagnosis, treatment plan comprising goals in the areas of autonomy and participation formulated by SMART.
6. Communication between various disciplines and reports from multidisciplinary rehabilitation meetings in which it is clearly stated who the treating professionals involved are.
7. Measurement and evaluation instruments should be used at the start of treatment, halfway through and at the end of treatment (PROMs and tests).
8. Regular feedback to referring professional and general practitioner concerning intake and results of treatment.
9. Outpatient check-ups.

No systematic research has been done into the effect of the use of a record of this type on quality of care. The development group deems it likely that coordination will be improved, and with this the quality of patient care provided by specialised medical rehabilitation in oncology. The patient should be able to access the care record.

Communication with the patient in specialised medical rehabilitation in oncology
Good communication between health care professionals and patients is vital in order to get the best results from specialised medical rehabilitation in oncology.

A distinction can be made between affect-oriented communication and task-oriented communication between healthcare professionals (formal and informal) and patient [Brink-Muinen, 2004]. Affect-oriented communication comprises personal remarks, concern and reassurance, and paraphrasing. This operates at the emotional level.

Task-oriented communication comprises asking questions, giving or obtaining information, giving advice on medical, therapeutic and/or psychosocial problems. This operates at the rational level.
The health care professional must be sure at which level the communication between him/her and the patient is taking place.

The majority of patients wish to have information about specialised medical rehabilitation treatment methods. However, the goal of the healthcare professional is not only to answer the patient's questions and to pass on knowledge; the goal is to share information thus enabling the patient to make choices and decisions in partnership with the healthcare professional (shared decision making). This should result in the patient taking their care into their own hands as much as possible (3goedevragen).

There are a number of general and practical recommendations to optimise communication between healthcare professional and patient [Stam J, 2001]:

- When an indication for specialised medical rehabilitation in oncology has been made, actively seek contact with the patient.
- Ensure you have a good knowledge of the disease, the prognosis and treatment options.
- Make a firm offer of help: what can be expected from you, what are the possibilities?
- Exchange information with all the other treating professionals and healthcare professionals.

It is likely that good communication, while being mindful of the recommendations above, will lead to better decision making, improved patient compliance, and ultimately better results for specialised medical oncological rehabilitation treatment.

Good communication with partners and informal caregivers is recommended as it is an important form of support.

The empowerment role of the patient
The patient occupies the central position during specialised medical oncological rehabilitation period. However, the patient may feel powerless due to what has overcome him or her. Emotions and self-confidence are important in this, but the degree of insight into, and overview of, the situation also influence this. Feelings of loss of control are also involved. Communicating on the same level and the feeling that the professional sees the patient as someone who can and does make their own choices, are extremely important for patient satisfaction and to be able to work together. If the patient is nevertheless no longer able to play a central empowerment role in his/her treatment, then, in consultation with the patient, this role can be passed on to family or friends, or to a healthcare professional.

Schooling/quality framework/training courses
The Netherlands Society of Rehabilitation Medicine (NSRM) working group Cancer rehabilitation provides a nationwide coverage of specialised medical rehabilitation in oncology. The NSRM is responsible for the quality system in rehabilitation medicine and has recently introduced a framework of treatment in which this has been implemented.
Geriatric rehabilitation care (GRC)
The development group has reached the consensus that on discharge from hospital, vulnerable, mainly elderly, patients with cancer, who are too vulnerable to be discharged home, should be considered for clinical multidisciplinary oncological rehabilitation in geriatric rehabilitation care. The main difference between GRC and specialised medical rehabilitation (SMR) is the objective of treatment. The objective of GRC is for the patient to have the ability to function at home or in a care facility again, to be able to move around and to take care of themselves either independently or with the help of home care services. SMR is focused on autonomic participation such as resuming tasks within the family, returning to the workforce etc.
Costs

In the Netherlands, specialised medical oncological rehabilitation is included in the basic medical insurance package. Outpatient consultations with a rehabilitation physician are also included in the basic medical insurance package.
Psychosocial care is an integral part of the treatment of a complex requirement for somatic care. This means that if a Diagnosis Treatment Combination (DTC, DBC in Dutch) care product is open for funding, the cost of psychosocial care will be registered and borne via the funded DTC care product (in accordance with the DTC costing system). The underlying principle in this is that only psychosocial care that is necessary in connection with the treatment of a complex somatic care requirement may be financed via specialised medical care.
If care is given after completion of the care trajectory and it falls outside the scope of the funding regulation above, then funding often falls back on primary care.

Primary care is insured care, unless the insurance package is limited. This can come from both basic and additional insurances. Such a limited package may be applicable in the case of additional insurance for the performance of physiotherapy or exercise therapy (for adults). Before the start of treatment, it is important to advise the patient to check with his/her health insurer to see if they are covered for this type of treatment.
Since 2013, GRC has been included in the Health Insurance Decree, which falls under the Dutch Healthcare Insurance Act. GRC is funded from DTCs and is delivered by a specialist elderly care physician at an organisation that offers rehabilitation care to the elderly. GRC has been accorded its own place in the DTC system. Therefore, in the Netherlands, where means of delivery and systems are concerned, the DTC structure of hospitals is the same as that of GRC and also of specialised medical rehabilitation. Of course, care activities, DTC care products and tariffs have been formulated specifically for GRC.

# Overview of gaps in knowledge

**Literature review:**
**Knowledge gaps 2017**

**Effectiveness of interdisciplinary specialised medical rehabilitation during curative oncology treatment**
The effectiveness of interdisciplinary specialised medical rehabilitation during planned curative oncology treatment based on the selected outcome measures is still unknown. Research has been done which compared this approach with monodisciplinary interventions.
Further research will broaden the body of evidence on uni- and multimodal supportive interventions during planned curative treatment.
In this there are a number of research priorities:

- the optimal timing and duration of rehabilitation and interventions in the setting of rehabilitation
- the optimal dosing and form of interventions
- gaining insight into the selection of patients for whom monodisciplinary or multidisciplinary interventions will be effective.

The effect of specialised medical rehabilitation and of monodisciplinary interventions that can be implemented in the context of cancer rehabilitation on continuing medical treatment should be further investigated in randomised controlled studies.

Randomised studies are needed to investigate the effect of medical specialist rehabilitation and monodisciplinary interventions implemented in the setting of recovery from cancer on survival.

**Work**
More research is necessary into the effectiveness of interventions focused on stimulating participation in work during and after planned curative treatment.

**Cost-effectiveness**
The cost-effectiveness of multimodal interventions and interdisciplinary specialised medical rehabilitation in oncology aimed at the improvement of psychosocial and physical problems in the patient with cancer is still unknown. Research comparing this approach with monodisciplinary interventions and with standard care is still necessary.

**Knowledge gaps 2011**
The development group encountered a number of gaps in knowledge in the search for evidence and in answering the ten clinical questions. More research on cancer rehabilitation is desirable. The gaps in knowledge have been prioritised by the development group and the top 3 gaps in knowledge are described in more detail below.

<u>Knowledge gap 1:</u>
There is a lack of knowledge about the underlying mechanisms of the long-term side effects and late effects of cancer treatment.

*Context knowledge gap 1*
Cancer patients often have to deal with long-term side effects and late effects of cancer treatment. Insight in the underlying pathophysiological mechanisms of action and the genetic basis is required in order to treat these side effects and effects in an effective manner.

*What is the benefit of researching knowledge gap 1?*
Gaining insight in the underlying mechanisms of action will provide a better foundation for the treatment selected (whether it be medication-based, or using a form of rehabilitation or other treatment). It is expected that this will increase the efficacy of treatment. A better result can be obtained in a shorter period of time, resulting in a health benefit for the patient and it is expected this would lead to a reduction in care costs.

*How should knowledge gap 1 be researched?*

It is recommended that knowledge gap 1 is researched with fundamental research on the underlying pathophysiological mechanisms and gene mutations involved in long-term side effects and the late effects of cancer treatment. In first instance, there is a preference for research on the long-term and incapacitating fatigue that occurs with many cancer survivors.

Knowledge gap 2:
As yet, there is insufficient knowledge about the efficacy and suitability of different forms of cancer rehabilitation.

*Context knowledge gap 2*
There is still insufficient known about which form of cancer rehabilitation is the most effective. Different studies have been conducted so far, especially after completing breast cancer treatment, in which mainly different forms of training (both recommendations for physical activity and guided training programmes in different forms) have been compared with a control group that does not train. Only limited research has been performed on which form of aerobic and/or progressive resistance training (with which duration, intensity etc.) is the most effective for which patient. Combinations of physical training with Psychoeducation or workforce reintegration, for example, have also not been studied or only to a limited degree.

*What is the benefit of researching knowledge gap 2?*
By gaining more insight in the efficacy and suitability of different forms of cancer rehabilitation, the most appropriate form of rehabilitation can be chosen for each patient. By applying the tailored healthcare principle, the care offered becomes more effective and suitable and yields a greater health benefit for the patient.

*How should knowledge gap 2 be researched?*
Follow-up research is required, also for diagnoses other than breast cancer and in all phases of the cancer treatment process, in which different forms of cancer rehabilitation are compared. Aside from physical training, attention should also be given to psychosocial guidance, work reintegration or dietary interventions, for example. Several studies are currently already being conducted in the Netherlands that compare different forms of physical training (PACES, EXIST, REACT). However, additional research is needed with vulnerable groups such as minority groups, the elderly and people with poor literacy. It is important with all these studies that standardised and valid outcome measures are used to optimise comparability between rehabilitation programmes, so that protocols for cancer rehabilitation based on evidence can be developed in the future.

Knowledge gap 3:
As yet, there is insufficient knowledge about determinants for selecting a specific cancer rehabilitation programme.

*Context knowledge gap 3*
The expert group recommends preceding the cancer rehabilitation programme with an intake cancer rehabilitation. The care request and problems of the patient are detailed during this intake and a rehabilitation programme is compiled in consultation with the patient. To be able to provide the best advice to the patient about this, it is important to have an insight in the determinants that justify the choice for specific cancer rehabilitation programmes.

*What is the benefit of researching knowledge gap 3?*
Better ‘tailored healthcare' can be offered by gaining more insight in the determinants for selecting the most suitable rehabilitation programme. It is expected that this will make care more effective and suitable and provide more health benefit for the patient in a shorter period of time.

*How should knowledge gap 3 be researched?*
The development group recommends registering the data of patients referred for an intake cancer rehabilitation and the various rehabilitation modules, so that more evidence will become available over time regarding the efficacy of the work method followed. The user-friendliness and efficacy of the decision tree ‘Cancer rehabilitation' should be studied more closely.

# References


*1* - Aaronson NK
Aaronson NK, Ahmedzai S, Bergman B, Bullinger M, Cull A, Duez NJ et al. The European Organization for Research and Treatment of Cancer QLQ-C30: a quality-of-life instrument for use in international clinical trials in oncology. J Natl Cancer Inst 1993; 85: 365-376.

*2* - Aaronson NK
Aaronson NK, Muller M, Cohen PD, Essink-Bot ML, Fekkes M, Sanderman R et al. Translation, validation, and norming of the Dutch language version of the SF-36 Health Survey in community and chronic disease populations. J Clin Epidemiol 1998; 51: 1055-68.

*3* - Agasi-Idenburg SC
Agasi-Idenburg SC, Velthuis MJ, Wittink H. Quality criteria and user-friendliness in self-reported questionnaires on cancer-related fatigue: a review. J Clin Epidemiol 2010;63(7):705-11.

*4* - Alexander S
Alexander S, Minton O, Stone PC. Evaluation of screening instruments for cancer-related fatigue syndrome in breast cancer survivors. J Clin Oncol 2009; 27(8): 1197-1201.

*5* - Alfano CM
Alfano CM, Rowland JH. Recovery issues in cancer survivorship: a new challenge for supportive care. Cancer J 2006; 12(5): 432-43.

*6* - American College of Sports Medecine
American College of Sports Medicine (ACSM). ACSM guidelines for exercise testing and prescription. Edition 8, 2009.

*7* - Amir Z
Amir Z, Wynn P, Whitaker S, Luker K. Cancer survivorship and return to work: UK occupational physician experience. Occup Med (Lond) 2009; 59(6): 390-6.

*8* - Andersson EI
Andersson EI, Lin CC, Smeets RJ. Performance Tests in People With Chronic Low Back Pain. Responsiveness and Minimal Clinically Important Change. Spine. 2010 Jul 14 [Epub ahead of print]

*9* - Aujoulat I
Aujoulat I, d'Hoore W, Deccache A. Patient empowerment in theory and practice: Polysemy or cacophony? Patient Educ Couns 2007;66:13-20.

*10* - Balady GJ
Balady GJ, Williams MA, Ades PA, Bittner V, Comoss P, Foody JM et al. Core components of cardiac rehabilitation/secondary prevention programs: 2007 update: a scientific statement from the American Heart Association Exercise, Cardiac Rehabilitation, and Prevention Committee, the Council on Clinical Cardiology; the Councils on Cardiovascular Nursing, Epidemiology and Prevention, and Nutrition, Physical Activity, and Metabolism; and the American Association of Cardiovascular and Pulmonary Rehabilitation. Circulation 2007; 115(20): 2675-82.

*11* - Bandura A
Bandura A. Social Foundation of Thought and Action: A social cognitive Theory. Englewood Cliffs, N.J.: Prentice Hall, 1986.

*12* - Bandura A
Bandura A. Self-efficacy: The Exersize of Control. New York: WH Freeman, 1997.

*13* - Battaglini C
Battaglini C, Bottaro M, Dennehy C, Rae L, Shields E, Kirk D et al. The effects of an individualized exercise intervention on body composition in breast cancer patients undergoing treatment. Sao Paulo Med J 2007; 125(1): 22-8.

*14* - Battaglini CL
Battaglini CL, Mihalik JP, Bottaro M, Dennehy C, Petschauer MA, Hairston LS et al. Effect of exercise on the caloric intake of breast cancer patients undergoing treatment. Braz J Med Biol Res 2008; 41(8): 709-15.

*15* - Bennett JA
Bennett JA, Lyons KS, Winters-Stone K, Nail LM, Scherer J, Bennett JA, et al. Motivational interviewing to increase physical activity in long-term cancer survivors: a randomized controlled trial. Nurs Res 2007; 56(1): 18-27.

*16* - Black C
Black C. Working for a healthier tomorrow. London: The Stationery Office, 2008.

*17* - Bonnefoy M
Bonnefoy M, Normand S, Pachiaudi C, Lacour J R, Laville M, Kostka T. Simultaneous validation of ten physical activity questionnaires in older men: a doubly labeled water study. J Am Geriatr Soc 2001; 49: 28-35.

*18* - Booth S
Booth S, Adams L. The shuttle walking test: a reproducible method for evaluating the impact of shortness of breath on functional capacity in patients with advanced cancer. Thorax. 2001; 56(2): 146-150.

*19* - Bosy-Westphal A
Bosy-Westphal A, Later W, Hitze B, Sato T, Kossel E, Gluer CC, Heller M, Muller MJ. Accuracy of bioelectrical impedance consumer devices for measurement of body composition in comparison to whole body magnetic resonance imaging and dual X-ray absorptiometry. Obes Facts. 2008; 1(6):319-24.

*20* - Bower JE
Bower JE, Ganz PA, Desmond KA, Rowland JH, Meyerowitz BE, Belin TR. Fatigue in breast cancer survivors: occurrence, correlates, and impact on quality of life. J Clin Oncol 2000; 18(4): 743-53.

*21* - Bouma J
Bouma J, Ranchor AV, Sanderman R, Van Sonderen E. Het meten van depressie met de CES-D, een handleiding. Groningen. Noordelijk Centrum voor Gezondheidsvraagstukken, 1995

*22* - Brady MJ
Brady MJ, Cella DF, Mo F, Bonomi AE, Tulsky DS, Lloyd SR et al. Reliability and validity of the Functional Assessment of Cancer Therapy-Breast quality-of-life instrument. J Clin Oncol 1997; 15: 974-86.

*23* - Bradley N
Bradley N, Davis L, Chow E. Symptom distress in patients attending an outpatient palliative radiotherapy clinic. J Pain Symptom Manage 2005; 30(2): 123-31.

*24* - Brooks D
Brooks D, Solway S, Gibbons WJ. ATS statement on six-minute walk test. Am J Respir Crit Care Med 2003; 167(9): 1287.

*25* - Brown P
Brown P, Clark MM, Atherton P, Huschka M, Sloan JA, Gamble G, et al. Will improvement in quality of life (QOL) impact fatigue in patients receiving radiation therapy for advanced cancer? Am J Clin Oncol 2006; 29(1): 52-8.

*26* - Burgess C
Burgess C, Cornelius V, Love S, Graham J, Richards M, Ramirez A. Depression and anxiety in women with early breast cancer: five year observational cohort study. BMJ 2005; 330(7493): 702-705.

*27* - Buysse DJ
Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry Res 1989; 28: 193-213.

*28* - Burnham TR

Burnham TR, Wilcox A. Effects of exercise on physiological and psychological variables in cancer survivors. Med Sci Sports Exerc 2002; 34(12): 1863-7.

*29* - Cadmus LA
Cadmus LA, Salovey P, Yu H, Chung G, Kasl S, Irwin ML. Exercise and quality of life during and after treatment for breast cancer: results of two randomized controlled trials. Psychooncology 2009; 18(4): 343-52.

*30* - Campbell A
Campbell A, Mutrie N, White F, McGuire F, Kearney N. A pilot study of a supervised group exercise programme as a rehabilitation treatment for women with breast cancer receiving adjuvant treatment. Eur J Oncol Nurs 2005; 9(1): 56-63.

*31* - Carroll C
Carroll C, Rick J, Pilgrim H, Cameron J, Hillage J. Workplace involvement improves return to Work rates among employees with back pain on long-term sick leave: a systematic review of the effectiveness and cost-effectiveness of interventions. Disabil Rehabil 2010;32(8):607-21.

*32* - Cella DF
Cella DF, Tulsky DS, Gray G, Sarafian B, Linn E, Bonomi A et al. The Functional Assessment of Cancer Therapy scale: development and validation of the general measure. J Clin Oncol 1993; 11: 570-9.

*33* - Cella D
Cella D. The Functional Assessment of Cancer Therapy-Anemia (FACT-An) Scale: a new tool for the assessment of outcomes in cancer anemia and fatigue. Semin Hematol 1997; 34(3 Suppl 2): 13-9.

*34* - Cella D
Cella D, Peterman A, Passik S, Jacobsen P, Breitbart W. Progress toward guidelines for the management of fatigue. Oncology (Williston Park) 1998; 12(11A): 369-77.

*35* - Cella D
Cella D, Eton DT, Lai JS, Peterman A H, Merkel D E. Combining anchor and distribution-based methods to derive minimal clinically important differences on the Functional Assessment of Cancer Therapy (FACT) anemia and fatigue scales. J Pain Symptom Manage 2002a; 24: 547-61.

*36* - Cella D
Cella D, Hahn EA, Dineen K. Meaningful change in cancer-specific quality of life scores: Differences between improvement and worsening. Qual Life Res 2002b; 11: 207-21.

*37* - Cella D
Cella D, Yount S, Sorensen M, Chartash E, Sengupta N, Grober J. Validation of the Functional Assessment of Chronic Illness Therapy Fatigue Scale relative to other instrumentation in patients with rheumatoid arthritis. J Rheumatol 2005; 32(5): 811-9.

*38* - Centers for Disease Control and Prevention
Centers for Disease Control and Prevention (CDC) and Lance Armstrong Foundation. A National Action Plan for Cancer Survivorship: advancing public health strategies. USA: 2004.

*39* - Chalder T
Chalder T, Berelowitz G, Pawlikowska T, Watts L, Wessely S, Wright D, et al. Development of fatigue scale. J Psychosom Res 1993; 37(2): 147-53.

*40* - Cheema B
Cheema B, Gaul CA, Lane K, Fiatasone Singh MA. Progressive resistance training in breast cancer: A systematic review of clinical trials. Breast Cancer Res Treat 2008; 109(1): 9-26.

*41* - Cho OH
Cho OH, Yoo YS, Kim NC. Efficacy of comprehensive group rehabilitation for women with early breast cancer in South Korea. Nurs Health Sci 2006; 8(3): 140-6.

*42* - Cinar N
Cinar N, Seckin U, Keskin D, Bodur H, Bozkurt B, Cengiz O. The effectiveness of early rehabilitation in patients with modified radical mastectomy. Cancer Nurs 2008; 31(2): 160-5.

*43* - Coleman EA
Coleman EA, Coon SK, Kennedy RL, Lockhart KD, Stewart CB, Anaissie EJ et al. Effects of exercise in combination with epoetin alfa during high-dose chemotherapy and autologous peripheral blood stem cell transplantation for multiple myeloma. Oncol Nurs Forum 2008; 35(3): 53-61.

*44* - Coleman EA
Coleman EA, Hall-Barrow J, Coon S, Stewart CB. Facilitating exercise adherence for patients with multiple myeloma. Clin J Oncol Nurs 2003; 7(5): 529-34.

*45* - College voor Zorgverzekeringen
College voor zorgverzekeringen (CVZ). Standpunt Oncologisch Revalidatie. Diemen, 2008.

*46* - Conner M
Conner M, Normal P. Predicting Health Behaviour. New York: Open University Press, 2005.

*47* - Courneya KS
Courneya KS. Exercise interventions during cancer treatment: biopsychosocial outcomes. Exerc Sport Sci Rev 2001; 29(2): 60-4.

*48* - Courneya KS
Courneya KS, Friedenreich CM, Sela RA, Quinney HA, Rhodes RE, Courneya KS, et al. Correlates of adherence and contamination in a randomized controlled trial of exercise in cancer survivors: an application of the theory of planned behavior and the five factor model of personality. Ann Behav Med 2002; 24(4): 257-68.

*49* - Courneya KS
Courneya KS, Friedenreich CM, Quinney HA, Fields AL, Jones LW, Fairey AS. A randomized trial of exercise and quality of life in colorectal cancer survivors. Eur J Cancer Care 2003; 12(4): 347-57.

*50* - Courneya KS
Courneya KS, Segal RJ, Reid RD, Jones LW, Malone SC, Venner PM, Parliament MB, Scott CG, Quinney HA, Wells GA. Three independent factors predicted adherence in a randomized controlled trial of resistance exercise training among prostate cancer survivors. J Clin Epidemiol 2004; 57: 571-9.

*51* - Courneya KS
Courneya KS, Segal RJ, Mackey JR, Gelmon K, Reid RD, Friedenreich CM et al. Effects of aerobic and resistance exercise in breast cancer patients receiving adjuvant chemotherapy: A multicenter randomized controlled trial. J Clin Oncol 2007; 25(28): 4396-404.

*52* - Courneya KS
Courneya KS, Segal RJ, Gelmon K, Reid RD, Mackey JR, Friedenreich CM et al. Six-month follow-up of patient-rated outcomes in a randomized controlled trial of exercise training during breast cancer chemotherapy. Cancer Epidemiol Biomarkers Prev 2007b; 16(12): 2572-8.

*53* - Courneya KS
Courneya KS, Jones LW, Peddle CJ, Sellar CM, Reiman T, Joy AA, Chua N, Tkachuk L, Mackey JR. Effects of aerobic exercise training in anemic cancer patients receiving darbepoetin alfa: a randomized controlled trial. Oncologist 2008; 13(9): 1012-20.

*54* - Courneya KS
Courneya KS, Booth CM, Gill S, O'Brien P, Vardy J, Friedenreich CM et al. The Colon Health and Life-Long Exercise Change trial: a randomized trial of the National Cancer Institute of Canada Clinical Trials Group. Curr Oncol 2008; 15(6): 279-85.

*55* - Cramp F
Cramp F, Daniel J. Exercise for the management of cancer-related fatigue in adults. Cochrane Database

Syst Rev. 2008; 2: CD006145.

*56* - Culos-Reed SN
Culos-Reed SN, Robinson JW, Lau H, Stephenson L, Keats M, Norris S, Kline G, Faris P. Physical activity for men receiving androgen deprivation therapy for prostate cancer: benefits from a 16-week intervention. Support Care Cancer 2010; 18(5): 591-599

*57* - Daley AJ
Daley AJ, Mutrie N, Crank H, Coleman R, Saxton J. Exercise therapy in women who have had breast cancer: design of the Sheffield women's exercise and well-being project. Health Educ Res 2004; 19(6): 686-97.

*58* - Daley AJ
Daley AJ, Crank H, Saxton JM, Mutrie N, Coleman R, Roalfe A. Randomized trial of exercise therapy in women treated for breast cancer. J Clin Oncol 2007; 25(13): 1713-21.

*59* - Daley AJ
Daley AJ, Crank H, Mutrie N, Saxton JM, Coleman R. Determinants of adherence to exercise in women treated for breast cancer. Eur J Oncol Nurs 2007; 11(5): 392-9.

*60* - De Backer
De Backer I, Schep G, Hoogeveen A, Vreugdenhil G, Kester AD, Van Breda E. Exercise testing and training in a cancer rehabilitation program: the advantage of the steep ramp test. Arch Phys Med Rehabil 2007; 88(5): 610-6.

*61* - De Backer I
De Backer I, Van Breda E, Vreugdenhil A, Nijziel MR, Kester AD, Schep G. High-intensity strength training improves quality of life in cancer survivors. Acta Oncol 2007; 46 (8): 1143-51.

*62* - De Backer I
De Backer I, Vreugdenhil G, Nijziel MR, Kester AD, Van Breda E, Schep G. Long-term follow-up after cancer rehabilitation using high-intensity resistance training: persistent improvement of physical performance and quality of life. Br J Cancer 2008; 99(1):30-6.

*63* - De Backer I
De Backer I, Schep G, Backx FJ, Vreugdenhil G, Kuipers H. Resistance training in cancer survivors: a systematic review. Int J Sports Med 2009; 30 (10): 703-12.

*64* - De Boer AG
De Boer AG, Verbeek JH, Spelten ER, Uitterhoeve AL, Ansink AC, De Reijke TM et al. Work ability and return-to-work in cancer patients. Br J Cancer 2008; 98(8): 1342-7.

*65* - De Haes JC
De Haes JC, van Knippenberg FC, Neijt JP. Measuring psychological and physical distress in cancer patients: structure and application of the Rotterdam Symptom Checklist. Br J Cancer 1990; 62: 1034-8.

*66* - De Nijs EJ
De Nijs EJ, Ros W, Grijpdonck MHD. Nursing intervention for fatigue during the treatment for cancer. Cancer Nurs 2008; 31(3): 191-206

*67* - Den Oudsten BL
Den Oudsten BL, van Heck GL, van der Steeg AFW, Roukema JA, de Vries J. Predictors of depressive symptoms 12 months after surgical treatment of early-stage breast cancer. Psychooncology 2009; 18(11): 1230-7.

*68* - Den Oudsten BL
Den Oudsten BL, Van Heck GL, Van der Steeg AFW, Roukema JA, De Vries J. Second operation is not related to psychological outcome in breast cancer patients. Int J Cancer 2010; 126(6):1487-93.

*69* - De Vries G

De Vries G. Kikkert MJ, Schene AH, Swinkels J. Helpt arbeidshulpverlening bij patiënten met een depressie. Nederlands Tijdschrift voor Ergotherapie 2003; 3: 103-107.

*70* - Dimeo FC
Dimeo FC, Stieglitz RD, Novelli-Fischer U, Fetscher S, Keul J. Effects of physical activity on the fatigue and psychologic status of cancer patients during chemotherapy. Cancer 1999; 5(10): 2273-7.

*71* - Dimeo FC
Dimeo FC, Thomas F, Raabe-Menssen C, Pröpper F, Mathias M. Effect of aerobic exercise and relaxation training on fatigue and physical performance of cancer patients after surgery. A randomised controlled trial. Support Care Cancer 2004; 12(11): 774-9.

*72* - Drouin JS
Drouin JS, Young TJ, Beeler J, Byrne K, Birk TJ, Hryniuk WM, Hryniuk LE. Random control clinical trial on the effects of aerobic exercise training on erythrocyte levels during radiation treatment for breast cancer. Cancer 2006; 107(10): 2490-5.

*73* - Dumurgier J
Dumurgier J, Elbaz A, Ducimetiere P, Tavernier B, Alperovitch A, Tzourio C. Slow walking speed and cardiovascular death in well functioning older adults: prospective cohort study. BMJ 2009; Nov 10;339: 4460.

*74* - Earle CC
Earle CC. Failing to plan is planning to fail: improving the quality of care with survivorship care plans. J Clin Oncol 2006; 24(32): 5112-6.

*75* - Enright PL
Enright PL, Sherrill DL. Reference equations for the six-minute walk in healthy adults. Am J Respir Crit Care Med 1998; 158: 1384-7.

*76* - ERS Task Force

ERS Task Force on Standardization of Clinical Exercise Testing. Clinical exercise testing with reference to lung diseases: indications, standardization and interpretation strategies.European Respiratory Society. Eur Respir J 1997; 10(11): 2662-89.

*77* - Eton DT
Eton DT, Cella D, Yost KJ, Yount SE, Peterman AH, Neuberg DS et al. A combination of distribution- and anchor-based approaches determined minimally important differences (MIDs) for four endpoints in a breast cancer scale. J Clin Epidemiol 2004; 57: 898-910.

*78* - Ferrari P
Ferrari P, Friedenreich C, Matthews CE. The role of measurement error in estimating levels of physical activity. Am J Epidemiol 2007; 166: 832-40.

*79* - Ferrel BR
Ferrel BR, Grant MM, Funk B et al. Quality of life in breast cancer survivors as identified by focus groups. Psychooncology 1997; 6: 13-23.

*80* - Fishbein M
Fishbein M, Ajzen I. Predicting and Changing Behavior. The Research Action Approach. New York: Psychology Press, 2010.

*81* - Foekema H
Foekema H, Gend SV. Vermoeidheid bij kanker, een belangrijk probleem. Rapport van het NIPO marktonderzoek instituut, Amsterdam 1999.

*82* - Franck E
Franck E, De Raedt R, Barbez C, Rosseel Y. Psychometric Properties of the Dutch Rosenberg Self-Esteem Scale. Psychologica Belgica 2008; 48(1):25-34.

*83* - Galvão DA
Galvão DA, Newton RU. Review of exercise intervention studies in cancer patients. J Clin Oncol 2005; 23(4): 899-909.

*84* - Galvão DA
Galvão DA, Nosaka K, Taaffe DR, Spry N, Kristjanson LJ, McGuigan MR et al. Resistance training and reduction of treatment side effects in prostate cancer patients. Med Sci Sports Exerc 2006; 38(12): 2045-52.

*85* - Galvão DA
Galvão DA, Taaffe DR, Spry N, Newton RU. Exercise can prevent and even reverse adverse effects of androgen suppression treatment in men with prostate cancer. Prostate Cancer Prostatic Dis 2007; 10(4): 340-6.

*86* - Ganz PA
Ganz PA, Desmond KA, Leedham B, Rowland JH, Meyerowitz BE, Belin TR. Quality of life in long-term, disease-free survivors of breast cancer: a follow-up study. J Natl Cancer Inst 2002; 94(1): 39-49.

*87* - Gezondheidsraad 2007
Gezondheidsraad (GR). Nacontrole in de oncologie. Doelen onderscheiden, inhoud onderbouwen. Den Haag: Gezondheidsraad, 2007.

*88* - Gibbons WJ
Gibbons WJ, Fruchter N, Sloan S, Levy RD. Reference values for a multiple repetition 6-minute Walk test in healthy adults older than 20 years. J Cardiopulm Rehabil 2001; 21:87-93.

*89* - Gielissen MF
Gielissen MF, Verhagen S, Witjes F, Bleijenberg G. Effects of cognitive behavior therapy in severely fatigued disease-free cancer patients compared with patients waitibng for cognitive behavior therapy: a randomised controlled trial. J Clin Oncol 2006;24:4882-7.

*90* - Gijsen BCM
Gijsen BCM, Hellendoorn-van Vreeswijk AJH, Koppejan-Rensenbrink AG & Remie ME. Kanker en revalidatie: Herstel en Balans, een innovatief programma. Utrecht: Vereniging van Integrale Kankercentra, 2005.

*91* - Gijsen BCM
Gijsen BCM, Koppejan-Rensenbrink AG, Van den Berg JP. Oncologische Revalidatie, multidisciplinaire nazorg bij kanker. In: de Haes JCJM, editor. Psychologische patiëntenzorg in de oncologie, 2008.

*92* - Gilchrist LS
Gilchrist LS, Galantino ML, Wampler M, Marchese VG, Morris GS, Ness KK. A Framework for Assessment in Oncology Rehabiliation. Phys Ther 2009; 89: 286-306.

*93* - Glasgow RE
Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: The RE-AIM framework. Am J Public Health 1999; 89: 1322-7.

*94* - Goedendorp MM
Goedendorp MM, Gielissen MFM, Verhagen CAH, Peters MEJW, Bleijenberg G. Severe fatigue and related factors in cancer patients before the initiation of treatment. Br J Cancer 2008; 99(9): 1408-14.

*95* - Goedendorp MM
Goedendorp MM, Gielissen MF, Verhagen CA, Bleijenberg G. Psychosocial interventions for reducing fatigue during cancer treatment in adults. Cochrane Database Syst Rev. 2009; (1): CD006953.

*96* - Gordon LG
Gordon LG, Scuffham P, Battistutta D, Graves N, Tweeddale M, Newman B. A cost-effectiveness analysis of two rehalilitation support services for woman with breast cancer. Breast Cancer Res Treat 2005; 94(2):

123-33.

*97* - Graves KD
Graves KD. Social cognitive theory and cancer patients' quality of life: A meta-analysis of psychosocial intervention components. Health Psychol 2003; 22(2): 210-9.

*98* - Grundy SM
Grundy SM, Cleeman JI, Merz CN, Brewer HB, Jr. Clark LT, Hunninghake DB et al. Implications of recent clinical trials for the National Cholesterol Education Program Adult Treatment Panel III guidelines. Circulation 2004; 110: 227-39.

*99* - Harvie MN
Harvie MN, Campbell IT, Baildam A, Howell A. Energy balance in early breast cancer patients receiving adjuvant chemotherapy. Breast Cancer Res Treat 2004; 83(3): 201-10.

*100* - Hawkes AL
Hawkes AL, Gollschewski S, Lynch BM, Chambers S. A telephone-delivered lifestyle intervention for colorectal cancer survivors 'CanChange': a pilot study. Psychooncology 2009; 18(4): 449-55.

*101* - Hawkes AL
Hawkes AL, Pakenham KI, Courneya KS, Gollschewski S, Baade P, Gordon LG et al. A randomised controlled trial of a tele-based lifestyle intervention for colorectal cancer survivors ('CanChange'): study protocol. BMC Cancer 2009; 9:286.

*102* - Hayes SC
Hayes SC, Reul-Hirche H, Turner J. Exercise and secondary lymphedema: safety, potential benefits, and research issues. Med Sci Sports Exerc 2009; 41(3): 483-9.

*103* - Headley JA
Headley JA, Ownby KK, John LD. The effect of seated exercise on fatigue and quality of life in women with advanced breast cancer. Oncol Nurs Forum 2004; 31(5): 977-83.

*104* - Henselmans I
Henselmans I. Psychological well-being and perceived control after a breast cancer diagnosis. Thesis. 2009. Groningen, University of Groningen.

*105* - Heyward
Heyward and Stolarczyk (eds). Applied Body Composition assessment. Champain (Il) Human Kinetics 1996

*106* - Hewitt M
Hewitt M, Rowland JH, Yancik R. Cancer Survivors in the United States: age, health and disability. J Gerontol A Biol Sci Med Sci. 2003; 58(1): 82-91.

*107* - Hinnen C
Hinnen C, Ranchor AV, Sanderman R, Snijders TAB, Hagedoorn M, Coyne JC. Course of Distress in Breast Cancer Patients, Their Partners, and Matched Control Couples. Ann Behav Med 2008; 36(2): 141-8.

*108* - Hjermstad ML
Hjermstad ML, Fossa SD, Oldervoll L, Holte H, Jacobsen AB, Loge JH. Fatique in long-term Hodgkin's disease survivors: a follow-up study. J Clin Oncol 2005; 23 (27): 6587-95.

*109* - Holmes MD
Holmes MD, Chen WY, Feskanich D, Kroenke CH, Colditz GA. Physical activity and survival after breast cancer diagnosis. JAMA 2005; 293(20): 2479-86.

*110* - Holzner B
Holzner B, Kemmler G, Sperner-Unterweger B, Kopp M, Dunser M, Margreiter R et al. Quality of Life measurement in oncology--a matter of the assessment instrument? Eur J Cancer 2001; 37: 2349-56.

*111* - Holzner B
Holzner B, Bode RK, Hahn EA, Cella D, Kopp M, Sperner-Unterweger B, Kemmler G. Equating EORTC QLQ-C30 and FACT-G scores and its use in oncological research. Eur J Cancer 2006; 42: 3169-77.

*112* - Hoopman R
Hoopman R, Muller MJ, Terwee CB, Aaronson NK. Translation and validation of the EORTC QLQ C30 for use among Turkish and Moroccan ethnic minority cancer patients in the Netherlands. Eur J Cancer 2006; 42: 1839-47.

*113* - Hoopman R
Hoopman R, Terwee CB, Muller MJ, Aaronson NK. Translation and validation of the SF-36 Health Survey for use among Turkish and Moroccan ethnic minority cancer patients in The Netherlands. Eur J Cancer 2006; 42: 2982-90.

*114* - Hwang JH
Hwang JH, Chang HJ, Shim YH, Park WH, Park W, Huh SJ, Yang JH. Effects of supervised exercise therapy in patients receiving radiotherapy for breast cancer. Yonsei Med J 2008; 9(3): 443-50.

*115* - IKNL
Integraal Kanker Centrum Nederland (IKNL). Richtlijn Herstel na Kanker. Utrecht, 2011.

*116* - Irwin ML
Irwin ML, Alvarez-Reeves M, Cadmus L, Mierzejewski E, Mayne ST, Yu H et al. Exercise improves body fat, lean mass, and bone mass in breast cancer survivors. Obesity (Silver Spring) 2009; 17(8): 1534-41.

*117* - Irwin ML
Irwin ML, Varma K, Alvarez-Reeves M, Cadmus L, Wiley A, Chung GG et al. Randomized controlled trial of aerobic exercise on insulin and insulin-like growth factors in breast cancer survivors: the Yale Exercise and Survivorship study. Cancer Epidemiol Biomarkers Prev 2009; 18(1): 306-13.

*118* - Jacobsen PB
Jacobsen PB. Assessment of fatigue in cancer patients. J Natl Cancer Inst Monogr 2004; (32): 93-7.

*119* - Jacobsen PB
Jacobsen PB, Donovan KA, Vadaparampil ST, Small BJ. Systematic review and meta-analysis of psychological and activity-based interventions for cancer-related fatigue. Health Psychol. 2007; 26(6): 660-7.

*120* - Jarden M
Jarden M, Baadsgaard MT, Hovgaard DJ, Boesen E, Adamsen L. A randomized trial on the effect of a ultimodal intervention on physical capacity, functional performance and quality of life in adult patients undergoing allogeneic SCT. Bone Marrow Transplant 2009; 43(9): 725-37.

*121* - Johns MW
Johns MW. A new method for measuring daytime sleepiness: the Epworth sleepiness scale. Sleep 1991; 14: 540-5.

*122* - Jolly K
Jolly K, Taylor RS, Lip GY, Singh S; BRUM Steering Committee. Reproducibility and safety of the incremental shuttle walking test for cardiac rehabilitation. Int J Cardiol. 2008; 125(1): 144-5.

*123* - Jones LW
Jones LW, Courneya KS, Fairey AS, Mackey JR. Effects of an oncologist's recommendation to exercise on self-reported exercise behavior in newly diagnosed breast cancer survivors: a single-blind, randomized controlled trial. Ann Behav Med. 2004; 28(2):105-13.

*124* - Jones LW
Jones LW, Courneya KS, Fairey AS, Mackey JR, Jones LW, Courneya KS, et al. Does the theory of planned behavior mediate the effects of an oncologist's recommendation to exercise in newly diagnosed breast cancer survivors? Results from a randomized controlled trial. Health Psychol 2005; 24(2): 189-97.

*125* - Jones LW
Jones LW, Demark-Wahnefried W. Diet, exercise, and complementary therapies after primary treatment for cancer. Lancet Oncol. 2006; 7: 1017-26.

*126* - Jones LW
Jones LW, Guill B, Keir ST, Carter K, Friedman HS, Bigner DD, et al. Using the theory of planned behavior to understand the determinants of exercise intention in patients diagnosed with primary brain cancer. Psycho-Oncology 2007; 16(3), 232-40.

*127* - Jones LW
Jones LW, Eves ND, Haykowsky M, Joy AA, Douglas PS. Cardiorespiratory exercise testing in clinical oncology research: systematic review and practice recommendations. Lancet Oncol 2008; 9(8): 757-65.

*128* - Kalaitzi C
Kalaitzi C, Kalantzis A, Gravas S, Georgiadis J, Christodoulou C. State anxiety during watchful waiting for urinary lithiasis. Int J Psychiatry Med 2006; 36(3): 323-31.

*129* - Kangas M
Kangas M, Bovbjerg DH, Montgomery GH, Kangas M, Bovbjerg DH, Montgomery GH. Cancer-related fatigue: a systematic and meta-analytic review of non-pharmacological therapies for cancer patients. Psychol Bull 2008; 134(5): 700-41.

*130* - Karvinen KH
Karvinen KH, Courneya KS, Plotnikoff RC, Spence JC, Venner PM, North S, et al. A prospective study of the determinants of exercise in bladder cancer survivors using the Theory of Planned Behavior. Support Care Cancer 2009; 17(2): 171-9.

*131* - Kemmler G
Kemmler G, Holzner B, Kopp M, Dunser M, Margreiter R, Greil R, Sperner-Unterweger B. Comparison of two quality-of-life instruments for cancer patients: the functional assessment of cancer therapy general and the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-C30. J Clin Oncol 1999; 17: 2932-40.

*132* - Kim CJ
Kim CJ, Kang DH, Smith BA, Landers KA. Cardiopulmonary responses and adherence to exercise in women newly diagnosed with breast cancer undergoing adjuvant therapy. Cancer Nurs 2006; 29(2): 156-65.

*133* - Kim SH
Kim SH, Son BH, Hwang SY, Han W, Yang JH, Lee S, et al. Fatigue and depression in disease-free breast cancer survivors: prevalence, correlates, and association with quality of life. J Pain Symptom Manage 2008; 35(6): 644-55.

*134* - King MB
King MB, Judge JO, Whipple R, Wolfson L. Reliability and responsiveness of two physical performance measures examined in the context of a functional training intervention. Phys Ther 2000; 80: 8-16.

*135* - Kirsh KL
Kirsh KL, Passik S, Holtsclaw E, Donaghy K, Theobald D. I get tired for no reason: a single item screening for cancer-related fatigue. J Pain Sympt Manage 2001; 22(5): 931-7.

*136* - Kirshbaum MN
Kirshbaum MN. A review of the benefits of whole body exercise during and after treatment for breast cancer. J Clin Nurs 2007; 16(1): 104-21.

*137* - Klepin HD
Klepin HD, Geiger AM, Tooze JA, Newman AB, Colbert LH, Bauer DC et al. Physical performance and subsequent disability and survival in older adults with malignancy: results from the health, aging and body composition study. J Am Geriatr Soc 2010; 58: 76-82.

*138* - Knols RH
Knols RH, Stappaerts KH, Fransen J, Uebelhart D, Aufdemkampe G. Isometric strength measurement for muscle weakness in cancer patients: reproducibility of isometric muscle strength measurements with a hand-held pull-gauge dynamometer in cancer patients. Support Care Cancer 2002; 10(5): 430-8.

*139* - Knols R
Knols R, Aaronson NK, Uebelhart D et al. Physical exercise in cancer patients during and after medical treatment: a systematic review of randomized and controlled clinical trials. J Clin Oncol 2005; 23(16): 3830-42.

*140* - Korfage IJ
Korfage IJ, Esskink-Bot ML, Janssens ACJW, Schroder FH, de Koning HJ. Anxiety and depression after prostate cancer diagnosis and treatment: 5-year follow-up. Br J Cancer 2006; 94(8): 1093-8.

*141* - Korstjens I
Korstjens I, May AM, van Weert E, Mesters I, Tan F, Ros WJ et al. Quality of life after self-management cancer rehabilitation: a randomized controlled trial comparing physical and cognitive-behavioral training versus physical training. Psychosom Med 2008; 70(4): 422-9.

*142* - Kroenke CH
Kroenke CH, Chen WY, Rosner B, Holmes MD. Weight, weight gain, and survival after breast cancer diagnosis. J Clin Oncol 2005; 23(7): 1370-8.

*143* - Richtlijn Lymfoedeem
Kwaliteitsinstituut voor de Gezondheidszorg (CBO). Richtlijn Lymfoedeem, Utrecht, 2002.

*144* - Richtlijn Cardiovasculair Risicomanagement
Kwaliteitsinstituut voor de Gezondheidszorg CBO en Nederlands Huisartsen Genootschap (CBO & NHG). Multidisciplinaire richtlijn cardiovasculair risicomanagement. Utrecht, 2006.

*145* - Leeuwen FE
Leeuwen FE, Alers KC, Vlems FA, Bausch-Goldbohm RA, Hopman-Rock M, Elias SG, et al. De rol van lichaamsbeweging bij preventie van kanker. Amsterdam: KWF kankerbestrijding. 2005

*146* - Lemieux J
Lemieux J, Beaton DE, Hogg-Johnson S, Bordeleau LJ, Hunter J, Goodwin PJ. Responsiveness to change [corrected] due to supportive-expressive group therapy, improvement in mood and disease progression in women with metastatic breast cancer. Qual Life Res 2007;16: 1007-17.

*147* - Levinger I
Levinger I, Goodman C, Hare DL, Jerums G, Toia D, Selig S. The reliability of the 1RM strength test for untrained middle-aged individuals. J Sci Med Sport 2009; 12: 310-6.

*148* - Ligibel JA
Ligibel JA, Campbell N, Partridge A, Chen WY, Salinardi T, Chen H et al. Impact of a mixed strength and endurance exercise intervention on insulin levels in breast cancer survivors. J Clin Oncol 2008; 26(6): 907-12.

*149* - Liu RD
Liu RD, Chinapaw MJ, Huijgens OC, Van Mechelen W. Physical exercise interventions in haematological cancer patients, feasible to conduct but effectiveness to be established: a systematic literature review. Cancer TreatRev 2009; 35(2): 185-92.

*150* - Loge JH
Loge JH, Abrahamsen AF, Ekeberg O, Kaasa S. Hodgkin's disease survivors more fatigued than the general population. J Clin Oncol 1999; 17(1): 253-61

*151* - London MR
London MR, McSkimming S, Drew N, Quinn C, Carney B. Evaluation of a comprehensive, adaptable,

life-affirming, longitudinal (CALL) palliative care project. J Palliat Med 2005; 8(6): 1214-25.

*152* - Lotfi-Jam K
Lotfi-Jam K, Carey M, Jefford M et al. Nonpharmacologic strategies for managing common chemotherapy adverse effects: a systematic review. J Clin Oncol 2008; 26(34): 5618-5629.

*153* - Lowe SS
Lowe SS, Watanabe SM, Courneya KS. Physical activity as a supportive care intervention in palliative cancer patients: a systematic review. J Support Oncol 2009; 7(1): 27-34.

*154* - Lucia A
Lucia A, Earnest C, Perez M. Cancer-related fatigue: can exercise physiology assist oncologists? Lancet Oncol 2003; 4(10): 616-25.

*155* - Lynn J
Lynn J, Adamson DM. Living well at the end of life. Adapting health care to serious chronic illness in old age. Washington: Rand Health, 2003.

*156* - Mao JJ
Mao JJ, Armstrong K, Bowman MA, Xie SX, Kadakia R, Farrar JT. Symptom burden among cancer survivors: impact of age and comorbidity. Journal of the American Board of Family Medicine: J Am Board Fam Med 2007; 20 (5): 434-43.

*157* - Marciniak
Marciniak CM, Sliwa JA, Semik GP. Functional Outcome Following Rehabilitation of the Cancer Patiënt. Arch Phys Med Rehabil 1996; 77(1): 54-7.

*158* - Marcus BH
Marcus BH, Simkin LR. The transtheoretical model: applications to exercise behaviour. Med Sci Sports Exerc 1994; 26: 1400-4.

*159* - Markes M
Markes M, Brockow T, Resch K. Exercise for women receiving adjuvant therapy for breast cancer. Cochrane Database Syst Rev 2006; 4: CD005001.

*160* - Matthews CE
Matthews CE, Wilcox S, Hanby CL, Der Ananian C, Heiney SP, Gebretsadik T et al. Evaluation of a 12-week home-based walking intervention for breast cancer survivors. Support Care Cancer 2007; 15(2): 203-11.

*161* - May AM
May AM, Van Weert E, Korstjens I, Hoekstra-Weebers JE, Van der Schans CP, Zonderland ML et al. Improved physical fitness of cancer survivors: A randomised controlled trial comparing physical training with physical and cognitive-behavioural training. Acta Oncol 2008; 47(5): 825-34.

*162* - May AM
May AM, Korstjens I, van Weert E, van den Borne B, Hoekstra-Weebers JE, van der Schans CP et al. Long-term effects on cancer survivors' quality of life of physical training versus physical training combined with cognitive-behavioral therapy: results from a randomized trial. Support Care Cancer 2009; 17(6): 653-63.

*163* - May AM
May AM, Van Weert E, Korstjens I, Hoekstra-Weebers JE, van der Schans CP, Zonderland ML et al. Monitoring training progress during exercise training in cancer survivors: a submaximal exercise test as an alternative for a maximal exercise test? Arch Phys Med Rehabil. 2010; 91(3): 351-7.

*164* - McNeely ML
McNeely ML, Parliament M, Courneya KS, Seikaly H, Jha N, Scrimger R et al. A pilot study of a randomized controlled trial to evaluate the effects of progressive resistance exercise training on shoulder dysfunction caused by spinal accessory neurapraxia/neurectomy in head and neck cancer survivors. Head

Neck 2004; 26(6): 518-30.

*165* - McNeely MLC
McNeely MLC, Campbell KL, Rowe BH, Klassen TP, Mackey JR, Courneya KS. Effects of exercise on breast cancer patients and survivors: A systematic review and meta-analysis. CMAJ 2006; 175(1): 34-41.

*166* - McNeely ML
McNeely ML, Parliament MB, Seikaly H, Jha N, Magee DJ, Haykowsky MJ et al. Effect of exercise on upper extremity pain and dysfunction in head and neck cancer survivors: a randomized controlled trial. Cancer 2008; 113(1): 214-22.

*167* - Meek PM
Meek PM, Nail LM, Barsevick A, Schwartz A L, Stephen S, Whitmer K et al. Psychometric testing of fatigue instruments for use with cancer patients. Nurs Res 2000; 49: 181-90.

*168* - Mello M
Mello M, Tanaka C, Dulley FL. Effects of an exercise program on muscle performance in patients undergoing allogeneic bone marrow transplantation. Bone Marrow Transplant 2003; 32(7): 723-8.

*169* - Meyerhardt JA
Meyerhardt JA, Heseltine D, Niedzwiecki D, Hollis D, Saltz LB, Mayer RJ et al. Impact of physical activity on cancer recurrence and survival in patients with stage III colon cancer: findings from CALGB 89803. J Clin Oncol 2006; 24(22): 3535-41.

*170* - Meyerhardt JA
Meyerhardt JA, Giovannucci EL, Holmes MD, Chan AT, Chan JA, Colditz GA et al. Physical activity and survival after colorectal cancer diagnosis. J Clin Oncol 2006; 24(22): 3527-34.

*171* - Miller R
Miller R. Implementing a survivorship care plan for patients with breast cancer. Clin J Oncol Nurs 2008; 12(3): 479-87.

*172* - Miller WR
Miller WR, Rollnick S. Motivational interviewing: preparing people for change. The Guilford Press, 2002.

*173* - Milne HM
Milne HM, Wallman KE, Gordon S, Courneya KS. Effects of combined aerobic and resistance exercise program in breast cancer survivors: a randomized controlled trial. Breast Cancer Res Treat 2008; 108: 279-88

*174* - Milne HM
Milne HM, Wallman KE, Gordon S, Courneya KS. Impact of a combined resistance and aerobic exercise program on motivational variables in breast cancer survivors: a randomized controlled trial. Ann Behav Med 2008; 36(2): 158-66.

*175* - Minton O
Minton O, Stone P. A systematic review of the scales used for the measurement of cancer-related fatigue (CRF). Ann Oncol 2009; 20(1): 17-25.

*176* - Mock V
Mock V, Pickett M, Ropka ME, Muscari Lin E, Stewart KJ, Rhodes VA et al. Fatigue and quality of life outcomes of exercise during cancer treatment. Cancer Pract 2001; 9(3): 119-27.

*177* - Mock V
Mock V, Frangakis C, Davidson NE, Ropka ME, Pickett M, Poniatowski B et al. Exercise manages fatigue during breast cancer treatment: a randomized controlled trial. Psychooncology 2005; 14(6): 464-77.

*178* - Mols F
Mols F. Thesis. Physical and psychological well-being among long-term cancer survivors, 2007.

*179* - Monga U
Monga U, Garber SL, Thornby J, Vallbona C, Kerrigan AJ, Monga TN et al. Exercise prevents fatigue and improves quality of life in prostate cancer patients undergoing radiotherapy. Arch Phys Med Rehabil 2007; 88(11): 1416-22.

*180* - Mourtzakis M
Mourtzakis M, Bedbrook M. Muscle atrophy in cancer: a role for nutrition and exercise. Appl Physiol Nutr Metab 2009; 34(5): 950-6.

*181* - Mustian KM
Mustian KM, Griggs JJ, Morrow GR, McTiernan A, Roscoe JA, Bole CW, et al. Exercise and side effects among 749 patients during and after treatment for cancer: a University of Rochester Cancer Center community clinical oncology program study. Support Care Cancer 2006; 14(17): 732-41.

*182* - Mutrie N
Mutrie N, Campbell AM, Whyte F, McConnachie A, Emslie C, Lee L et al. Benefits of supervised group exercise programme for women being treated for early stage breast cancer: Pragmatic randomised controlled trial. BMJ 2007; 334 (7592): 517.

*183* - NCCN
National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology. Cancer related fatigue, 2009.

*184* - NIVEL
Nederlands instituut voor onderzoek van de gezondheidszorg (Nivel). Zorg- en Maatschappelijke situatie van mensen met kanker in Nederland. 2005.

*185* - NKR
Nederlandse Kankerregistratie (NKR). www.iknl.nl, 2010.

*186* - NVD
Nederlandse Vereniging van Dietisten (NVD). Artsenwijzer Dietetiek. 2010.

*187* - Richtlijn Handelen
Nederlandse Vereniging voor Arbeids- en Bedrijfsgeneeskunde (NVAB). Richtlijn Handelen van de bedrijfsarts bij werknemers met psychische problemen. Utrecht, 2007.

*188* - Blauwdruk Kanker
Nederlandse Vereniging voor Arbeids- en Bedrijfsgeneeskunde (NVAB). Blauwdruk kanker en werk en bijbehorend achtergronddocument. Utrecht, 2009.

*189* - Richtlijn Hartrevalidatie
Nederlandse Vereniging voor Cardiologie (NVVC)/ Nederlandse Hartstichting. Projectgroep PAAHR: Richtlijn Hartrevalidatie (richtlijn 2004 gedeeltelijk herzien), 2010.

*190* - Newell SA
Newell SA, Sanson-Fisher RW, Savolainen NJ. Systematic review of psychological therapies for cancer patients: Overview and recommendations for future research. J Natl Cancer Inst 2002; 94(8): 558-84.

*191* - Nici L
Nici L, Donner C, Wouters E, Zuwallack R, Ambrosino N, Nourbeau J, et al. American Thorac Society/European Respiratory Society statement on pulmonary rehabilitation. Am J Respir Crit Care Med 2006; 173(12): 1390-413.

*192* - Oldervoll LM
Oldervoll LM, Loge JH, Paltiel H, Asp MB, Vidvei U, Wiken AN, et al. The effect of physical exercise program in palliative care: a phase II study. J Pain Symptom Manage 2006; 31(5): 421-30.

*193* - Osborn RL
Osborn RL, Demoncada AC, Feuerstein M. Psychosocial interventions for depression, anxiety, and quality

of life in cancer survivors: meta-analyses. Int J Psychiatry Med 2006; 36(1):13-34.

*194* - Osoba D
Osoba D. Interpreting the meaningfulness of changes in health-related quality of life scores: Lessons from studies in adults. Int J Cancer Suppl 1999; 12: 132-7.

*195* - Osoba D
Osoba D, Rodrigues G, Myles J, Zee B, Pater J. Interpreting the significance of changes in health related quality-of-life scores. J Clin Oncol 1998; 16: 139-44.

*196* - Parker PA
Parker PA, Baile WF, De Moor C, Cohen L. Psychosocial and demographic predictors of quality of life in a large sample of cancer patients. Psychooncology 2003; 12(2): 183-93.

*197* - Paskett ED
Paskett ED, Alfano CM, Davidson MA, Andersen BL, Naughton MJ, Sherman A, et al. Breast cancer survivors' health-related quality of life : racial differences and comparisons with noncancer controls. Cancer 2008; 113(11): 3222-30.

*198* - Patrick DL
Patrick DL, Gagnon DD, Zagari MJ, Mathijs R, Sweetenham J. Assessing the clinical significance of health-related quality of life (HrQOL) improvements in anaemic cancer patients receiving epoetin alfa. Eur J Cancer 2003; 39: 335-45.

*199* - Payne JK
Payne JK, Held J, Thorpe J, Shaw H. Effect of exercise on biomarkers, fatigue, sleep disturbances, and depressive symptoms in older women with breast cancer receiving hormonal therapy. Oncol Nurs Forum 2008; 35(4): 635-42.

*200* - Peeters FPML
Peeters FPML, Ponds RWHM, Vermeeren MTG. Affectiviteit en zelfbeoordeling van depressie en angst. Affectivity and self-report of depression and anxiety. Tijdschrift voor Psychiatrie 1996; 38: 240-250.

*201* - Pepin V
Pepin V, Laviolette L, Brouillard C, Sewell L, Singh SJ, Revill SM et al. Significance of changes in endurance shuttle walking performance. Thorax. 2010; Epub ahead of print

*202* - Perera S
Perera S, Mody S H, Woodman R C, Studenski S A. Meaningful change and responsiveness in common physical performance measures in older adults. J Am Geriatr Soc 2006; (54): 743-9.

*203* - Peuckmann V
Peuckmann V, Ekholm O, Rasmussen NK, Moller S, Groenvold M, Christiansen P, et al. Health-related quality of life in long-term breast cancer survivors: nationwide survey in Denmark. Breast Cancer Res Treat 2007; 104(1): 39-46.

*204* - Pinto BM
Pinto BM, Clark MM, Maruyama NC, Feder SI. Psychological and fitness changes associated with exercise participation among women with breast cancer. Psychooncology 2003; 12(2): 118-26.

*205* - Pinto BM
Pinto BM, Frierson GM, Rabin C, Trunzo JJ, Marcus BH. Home-based physical activity intervention for breast cancer patients. J Clin Oncol 2005; 23(15): 3577-87.

*206* - Pinto BM
Pinto BM, Rabin C, Dunsiger S. Home-based exercise among cancer survivors: adherence and its predictors. Psychooncology 2009; 18(4): 369-76.

*207* - Porock D
Porock D, Kristjanson LJ, Tinnelly K, Duke T, Blight J. An exercise intervention for advanced cancer

patients experiencing fatigue: a pilot study. J Pall Care 2000; 16(13): 30-6.

*208* - Prince SA
Prince SA, Adamo KB, Hamel ME, Hardt J, Gorber SC, Tremblay M. A comparison of direct versus self-report measures for assessing physical activity in adults: a systematic review. Int J Behav Nutr Phys Act 2008; 5: 56.

*209* - Puts MT
Puts MT, Versloot J, Muller MJ, Van Dam FS. The opinion on care of patients with cancer undergoing palliative treatment in day care. Ned Tijdschr Geneeskd 2004; 27(4): 277-80.

*210* - Radloff LS
Radloff LS. The CES-D Scale: A self-report depression scale for research in the general population. Applied Psychological Measures 2010; 1: 385-401.

*211* - Ransom S
Ransom S, Jacobsen PB, Booth-Jones M. Validation of the distress thermometer with bone marrow transplanted patients. Psychooncology 2006; 15(7): 604-12.

*212* - Rehse B
Rehse B, Pukrop R. Effects of psychosocial interventions on quality of life in adult cancer patients: Meta analysis of 37 published controlled outcome studies. Patient Educ Couns 2003; 50(2): 179-86.

*213* - Reynolds JM
Reynolds JM, Gordon TJ, Robergs RA. Prediction of one repetition maximum strength from multiple repetition maximum testing and anthropometry. J Strength Cond Res. 2006; 20(3): 584-92.

*214* - Revill SM
Revill SM, Morgan MD, Singh SJ, Williams J, Hardman AE. The endurance shuttle walk: a new field test for the assessment of endurance capacity in chronic obstructive pulmonary disease. Thorax. 1999; 54(3): 213-22.

*215* - Ries AL
Ries AL, Bauldoff GS, Carlin BW, Casaburi R, Emery CF, Mahler DA et al. Pulmonary Rehabilitation: Joint ACCP/AACVPR Evidence-Based Clinical Practice Guidelines. Chest 2007; 131(5 Suppl): 4S-42S.

*216* - Nationaal Kompas
Rijksinstituut voor Volksgezondheid en Milieu (RIVM). Nationaal Kompas. 2009.

*217* - Roine E
Roine E, Roine RP, Rasanen P, Vuori I, Sintonen H, Saarto T. Cost-effectiveness of interventions based on physical exercise in the treatment of various diseases: a systematic literature review. Int J Technol Assess Health Care 2009; 25(4): 427-54.

*218* - Rosenberg M
Rosenberg M. Society and the adolescent self.1965. New Jersey, Princeton University Press.

*219* - Roukema JA
Roukema JA, De Vries J. Lichaam en geest: samenspel. De Psycholoog 2007; 07/08: 412-418.

*220* - Santana MJ
Santana MJ, Au HJ, Dharma-Wardene M, Hewitt JD, Dupere D, Hanson J et al. Health-related Quality of life measures in routine clinical care: can FACT-fatigue help to assess the management of fatigue in cancer patients? Int J Technol Assess Health Care 2009; 25: 90-6.

*221* - Schmitz KH
Schmitz KH, Holzman J, Courneya KS, Mâsse LC, Duval S, Kane R. Controlled physical activity trials in cancer survivors: A systematic review and meta-analysis. Cancer Epidemiol Biomarkers Prev 2005; 14(7): 1588-15.

*222* - Schmitz KH
Schmitz KH, Troxel AB, Cheville A, Grant LL, Bryan CJ, Gross CR et al. Physical Activity and Lymphedema (the PAL trial): assessing the safety of progressive strength training in breast cancer survivors. Contemp Clin Trials 2009; 30(3): 233-45.

*223* - Schmitz KH
Schmitz KH, Courneya KS, Matthews C, Demark-Wahnefried W, Galvao DA, Pinto BM. et al. American College of Sports Medicine roundtable on exercise guidelines for cancer survivors. Med.Sci.Sports Exerc. 2010; 42: 1409-26.

*224* - Schroevers MJ
Schroevers MJ, Sanderman R, Van Sonderen E, Ranchor AV. The evaluation of the Center for Epidemiologic Studies Depression (CES-D) scale: Depressed and Positive Affect in cancer patients and healthy reference subjects. Qual Life Res 2000; 9(9): 1015-29.

*225* - Schroevers MJ
Schroevers MJ, Ranchor AV, Sanderman R. Depressive symptoms in cancer patients compared with people from the general population: The role of sociodemographic and medical factors. Journal of Psychosocial Oncology 2003a; 21(1): 1-26.

*226* - Schroevers MJ
Schroevers MJ, Ranchor AV, Sanderman R. The role of social support and self-esteem in the presence and course of depressive symptoms: a comparison of cancer patients and individuals from the general population. Soc Sci Med 2003; 57(2): 375-85.

*227* - Segal R
Segal R, Evans W, Johnson D, Smith J, Colletta S, Gayton J et al. Structured exercise improves physical functioning in women with stages I and II breast cancer: results of a randomized controlled trial. J Clin Oncol 2001; 19(3): 657-65.

*228* - Segal RJ
Segal RJ, Reid RD, Courneya KS, Malone SC, Parliament MB, Scott CG et al. Resistance exercise in men receiving androgen deprivation therapy for prostate cancer. J Clin Oncol 2003; 21(9): 1653-9.

*229* - Segal RJ
Segal RJ, Reid RD, Courneya KS, Sigal RJ, Kenny GP, Prud'Homme DG et al. Randomized controlled trial of resistance or aerobic exercise in men receiving radiation therapy for prostate cancer. J Clin Oncol 2009; 27(3): 344-51.

*230* - Shephard RJ
Shephard RJ. Limits to the measurement of habitual physical activity by questionnaires. Br J Sports Med 2003; 37: 197-206.

*231* - Shun SC
Shun SC, Beck SL, Pett MA, Richardson SJ. Assessing responsiveness of cancer-related fatigue instruments: distribution-based and individual anchor-based methods. Oncologist 2007; 12: 495-504.

*232* - Sinclair SJ
Sinclair SJ, Blais MA, Gansler DA, Sandberg E, Bistis K, LoCicero A. Psychometric properties of the Rosenberg Self-Esteem Scale: overall and across demographic groups living within the United States. Eval Health Prof 2010; 33(1): 56-80.

*233* - Singh SJ
Singh SJ, Jones PW, Evans R, Morgan MD. Minimum clinically important improvement for the incremental shuttle walking test. Thorax. 2008; 63(9): 775-7.

*234* - Smets EM
Smets EM, Garssen B, Bonke B, De Haes JC. The Multidimensional Fatigue Inventory (MFI) psychometric qualities of an instrument to assess fatigue. J Psychosom Res 1995; 39: 315-25.

*235* - Smets EM
Smets EM, Garssen B, Cull A, De Haes JC. Application of the multidimensional fatigue Inventory (MFI-20) in cancer patients receiving radiotherapy. Br J Cancer 1996; 73: 241-5.

*236* - Sola I
Sola I, Thompson EM, Subirana Casacuberta M, Lopez C, Pascual A. Non-invasive interventions for improving well-being and quality of life in patients with lung cancer. Cochrane Database of Systematic Reviews 2004; 4: CD004282.

*237* - Solano JP
Solano JP, Gomes B, Higginson I, Higginson IJ. A Comparison of Symptom Prevalence in Far Advanced Cancer, AIDS, Heart Disease, Chronic Obstructive Pulmonary Disease and Renal Disease. J Pain Symptom Manage 2006; 31(1): 58-69.

*238* - Spelten ER
Spelten ER, Sprangers MA, Verbeek JH. Factors reported to influence the return to work of cancer survivors: a literature review. Psychooncology 2002; 11(2): 124-31.

*239* - Spelten ER
Spelten ER, Verbeek JH, Uitterhoeve AL, Ansink AC, Van der Lelie J, De Reijke TM et al. Cancer, fatigue and the return of patients to work-a prospective cohort study. Eur J Cancer 2003; 39(11): 1562-7.

*240* - Spielberger CD
Spielberger CD, Gorsuch RL, Lushene RE. STAI Manual for the State-Trait Anxiety Inventory. 1970. Palo Alto CA, Consulting Psychologists Press.

*241* - Spinhoven P
Spinhoven P, Ormel J, Sloekers PPA, Kempen GIJM, Speckens AEM, VanHemert AM. A validation study of the Hospital Anxiety and Depression Scale (HADS) in different groups of Dutch subjects. Psychol Med 1997; 27(2): 363-70.

*242* - Stevinson C
Stevinson C, Lawlor DA, Fox KR. Exercise interventions for cancer patients: Systematic review of controlled trials. Cancer Causes Control 2004; 15(10): 1035-56.

*243* - Stevinson C
Stevinson C, Fox KR. Feasibility of an exercise rehabilitation programme for cancer patients. Eur J Cancer Care 2006; 15(4): 386-96.

*244* - Stommel M
Stommel M, Kurtz ME, Kurtz JC, Given CW, Given BA. A longitudinal analysis of the course of depressive symptomatology in geriatric patients with cancer of the breast, colon, lung, or prostate. Health Psychol. 2004; 23(6): 564-73.

*245* - Strasser F
Strasser F, Sweeney C, Willey J, Benisch-Tolley S, Palmer L, Bruera E. Impact of half-day multidisciplinary symptom control and palliative care outpatient clinic in a comprehensive cancer center on recommendations, symptom intensity, and patient satisfaction: a retrospective descriptive study. J Pain Symptom Manage 2004; 27(6): 481-91.

*246* - Tatrow K
Tatrow K, Montgomery GH. Cognitive behavioral therapy techniques for distress and pain in breast cancer patients: A meta-analysis. J Behav Med 2006; 29(1): 17-27.

*247* - Taylor S
Taylor S, Frost H, Taylor A, Barker K. Reliability and responsiveness of the shuttle walking test in patients with chronic low back pain. Physiother Res Int. 2001; 6(3): 170-8.

*248* - Temel JS
Temel JS, Pirl WF, Recklitis CJ, Cashavelly B, Lynch TJ. Feasibility and validity of a one-item fatigue

screen in a thoracic oncology clinic. Official Publication of the International Association for the Study of Lung Cancer. J Thorac Oncol 2006; 1(5):454-9.

*249* - Temel JS
Temel JS, Greer JA, Goldberg S, Vogel PD, Sullivan M, Pirl WF et al. A Structured Exercise Program for Patients with Advanced Non-small Cell Lung Cancer. J Thorac Oncol 2009; 4(5): 595-601.

*250* - Thorsen L
Thorsen L, Courneya KS, Stevinson C, Fossa SD. A systematic review of physical activity in prostate cancer survivors: outcomes, prevalence, and determinants. Support Care Cancer 2008; 16(9), 987-97.

*251* - Teunissen SCCM
Teunissen SCCM. Thesis: In palliative care symptoms mean everything, 2007.

*252* - Teunissen SC
Teunissen SC, Wesker W, Kruitwagen C, De Haes HC, Voest EE, De Graeff A. Symptom Prevalence in patients with incurable cancer: a systematic review. J Pain Symptom Manage 2007; 34(1): 94-104.

*253* - Tisdale MJ
Tisdale MJ. Mechanisms of cancer cachexia. Physiol Rev 2009; 89(2): 381-410.

*254* - Toles M
Toles M, Denmark-Wahnefried W. Nutrition and the cancer survivor: evidence to guide oncology nursing practice. Semin Oncol Nurs. 2008; 24(3): 171-9.

*255* - Troosters T
Troosters T, Gosselink R, Decramer M. Six minute walking distance in healthy elderly subjects. Eur Respir J 1999; 14: 270-4.

*256* - Tuinman MA
Tuinman MA, Gazendam-Donofrio SM, Hoekstra-Weebers JE. Screening and referral for psychosocial distress in oncologic practice: use of the Distress Thermometer. Cancer 2008; 113(4): 870-8.

*257* - Van Belle S
Van Belle S, Paridaens R, Evers G, Kerger J, Bron D, Foubert J, et al. Comparison of proposed diagnostic criteria with FACT-F and VAS for cancer-related fatigue: proposal for use as a screening tool. Support Care Cancer 2005; 13(4): 246-54.

*258* - Van den Beuken
Van den Beuken-Van Everdingen MH, De Rijke JM, Kessels AG, Schouten HC, Van Kleef M, Patijn J. Prevalence of pain in patients with cancer: a systematic review of the past 40 years. Ann Oncol 2007; 18(9): 1437-49.

*259* - Van den Beuken
Van den Beuken-Van Everdingen MH, De Rijke JM, Kessels AG, Schouten HC, Van Kleef M, Patijn J. Quality of life and non-pain symptoms in patients with cancer. J Pain Symptom Manage 2009; 38(2): 216-33.

*260* - Van der Ploeg HM
Van der Ploeg HM, Defares PB, Spielberger CD. Zelf-Beoordelings Vragenlijst. STAI versie DY-1 en DY-2. 1979. Lisse, Swets & Zeitlinger.

*261* - Van der Ploeg E
Van der Ploeg E, Mooren TT, Kleber RJ, van der Velden PG, Brom D. Construct validation of the Dutch version of the impact of event scale. Psychol Assess 2004; 16(1): 16-26.

*262* - Van Engen -Verheul M
Van Engen -Verheul M, Hellemans I, Goud R, Peek N. Beslisboom Poliklinische Indicatiestelling Hartrevalidatie. CARDSS team. NVVC, 2010.

*263* - Van Harten WH
Van Harten WH, Van Noort O, Warmerdam R, Hendricks H, Seidel E. Assessment of rehabilitation needs in cancer patients. Int J Rehabil Res 1998; 21, 247-57.

*264* - Van Weert E
Van Weert E, Hoekstra-Weebers J, Grol B, Otter R, Arendzen HJ, Postema K et al. A multidimensional cancer rehabilitation program for cancer survivors: effectiveness on health-related quality of life. J Psychosom Res 2005; 58(6): 485-96.

*265* - Van Weert E
Van Weert E, Hoekstra-Weebers J, Otter R, Postema K, Sanderman R, van der Schans C. Cancer-related fatigue: predictors and effects of rehabilitation. Oncologist 2006; 11(2): 184-96.

*266* - Van Weert E
Van Weert E. Thesis: Cancer rehabiliation – effects and mechanisms, 2007.

*267* - Van Weert E
Van Weert E, Hoekstra-Weebers JE, May AM, Korstjens I, Ros WJ, Van der Schans CP. The development of an evidence-based physical self-management rehabilitation programme for cancer survivors. Patient Educ Couns 2008; 71(2): 169-90.

*268* - Varekamp I
Varekamp I, Verbeek JHAM, Van Dijk FJH. How can we help employees with chronic diseases to stay at work? A review of interventions aimed at job retention and based on an emppowerment perspective. Int Arch Occup Environ Health 2006; 80: 87-97.

*269* - Varekamp I
Varekamp I, Heutink A, Landman S, Koning CEM, De Vries G, Van Dijk FJH. Facilitating empower-ment in employees with chronic disease: Qualitative analysis of the process of change. J Occup Rehabil 2009; 19: 398-408.

*270* - Velthuis MJ
Velthuis MJ, May AM, Koppejan-Rensenbrink RA, Gijsen BC, Van Breda E, De Wit GA et al. Physical Activity during Cancer Treatment (PACT) Study: design of a randomised clinical trial. BMC Cancer 2010; 10: 272.

*271* - Verdijk LB
Verdijk LB, van Loon L, Meijer K, Savelberg HH. One-repetition maximum strength test represents a valid means to assess leg strength in vivo in humans. J Sports Sci 2009; 27(1): 59-68.

*272* - Richtlijn Voeding
Vereniging van Integrale Kankercentra (VIKC). Richtlijn Algemene voedings- en dieetadviezen. Utrecht, 2005.

*273* - Richtlijn Pijn bij Kanker
Vereniging van Integrale Kankercentra (VIKC). Richtlijn Pijn bij Kanker, Utrecht, 2008.

*274* - Richtlijn Mammacarcinoom
Vereniging van Integrale Kankercentra (VIKC). Richtlijn Mammacarcinoom, Utrecht, 2008.

*275* - Richtlijn Detecteren
Vereniging van Integrale Kankercentra (VIKC). Richtlijn Detecteren behoefte psychosociale zorg. Utrecht, 2010.

*276* - Draaiboek
Vereniging van Integrale Kankercentra (VIKC). Draaiboek 'Ontwikkelen, implementeren en evalueren van richtlijnen. Utrecht, 2010.

*277* - Vodermaier A

Vodermaier A, Linden W, Siu C. Screening for Emotional Distress in Cancer Patients: A Systematic Review of Assessment Instruments. J Natl Cancer Inst 2009; 101(21):1464-88.

*278* - Waddell G
Waddell G, Burton AK. Is work good for your health and well-being? The Stationery Office, Norwich, UK, 2006.

*279* - Walsh JM
Walsh JM, Hussey J, Guinan E, O' Donnell D. 'Pragmatic randomized controlled trial of individually prescribed exercise versus usual care in a heterogeneous cancer survivor population': a feasibility study PEACH trial: prescribed exercise after chemotherapy. BMC Cancer 2010; 10: 42.

*280* - Wanrooij BS
Wanrooij BS, De Graeff A, Koopmans RTCM, Leget CJW, Prins JB, Vissers KCP et al. Palliatieve zorg in de dagelijkse praktijk. Bohn, Stafleu en Van Lochum, 2010.

*281* - Ware JEJ
Ware JEJ, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care 1992; 30: 473-83.

*282* - Wasserman K
Wasserman K. Diagnosing cardiovascular and lung pathophysiology from exercise gas exchange. Chest 1997; 112(4): 1091-101.

*283* - White SM
White SM, McAuley E, Estabrooks PA, Courneya KS. Translating Physical Activity Interventions for Breast Cancer Survivors into Practise: An Evaluation of Randomized Controlled Trials. Ann Behav Med 2009; 37: 10-9.

*284* - Win T
Win T, Jackson A, Groves AM, Sharples LD, Charman SC, Laroche CM. Comparison of shuttle walk with measured peak oxygen consumption in patients with operable lung cancer. Thorax. 2006; 61(1): 57-60.

*285* - Windsor PM
Windsor PM, Nicol KF, Potter J. A randomized, controlled trial of aerobic exercise for treatment-related fatigue in men receiving radical external beam radiotherapy for localized prostate carcinoma. Cancer 2004; 101(3): 550-7.

*286* - Winningham ML
Winningham ML, MacVicar MG, Bondoc M, Andersopn JL, Minton JP. Effect of aerobic exercise on body weight and compositiun in patients with breast cancer on adjuvant chemotherapy. Oncol Nurs Forum. 1989 Sept-Oct;16(5):683-9.

*287* - Wittink H
Wittink H. Functional capacity testing in patient with chronic pain. Clin J Pain 2005; 21: 197–9

*288* - Working group
Working group on cardiac rehabilitation exercise physiology and working group on heart failure of the European Society of Cardiology. Recommendations for exercise training in chronic heart failure patients. Eur Heart J 2001; 22(2): 125-35.

*289* - WHO QOL
World Health Organization Quality of Life assessment (WHOQOL): position paper from the World Health Organization. Soc Sci Med 1995;41:1403-9.

*290* - WHO
World Health Organization (WHO). Development of the World Health Organization WHOQOL BREF quality of life assessment. The WHOQOL Group. Psychol Med 1998a; 28: 551-8.

*291* - WHO QOL

World Health Organization Quality of Life Assessment (WHOQOL): development and general psychometric properties. Soc Sci Med 1998b; 46: 1569-1585.

*292* - WHO

World Health Organization (WHO).

WHO definition of BMI. 2000

*293* - WHO
World Health Organization (WHO). WHO definition of palliative care.

*294* - WHO
World Health Organization (WHO). Cancer control: knowledge into action. WHO guide for effective progammes. Diagnosis and treatment. Switserland, 2008.

*295* - Yellen SB
Yellen SB, Cella DF, Webster K, Blendowski C, Kaplan E. Measuring fatigue and other anemia related symptoms with the Functional Assessment of Cancer Therapy (FACT) measurement system. J Pain Symptom Manage 1997; 13(2): 63-74.

*296* - Yoshioka H
Yoshioka H. Rehabilitation for the terminal cancer patiënt. Am J Phys Med Rehabil 1994; 73: 199-206.

*297* - Zigmond AS
Zigmond AS, Snaith RP. The Hospital Anxiety and Depression Scale. Acta Psychiatr Scand 1983; 67(6): 361-70.

*298* - Zung WW
Zung WW. Factors influencing the self-rating depression scale. Arch Gen Psychiatry 1967a; 16(5): 543-7.

*299* - Zung WW
Zung WW. Depression in the normal aged. Psychosomatics 1967; 8(5): 287-92.

*300* - Voogt E
Voogt E, van der Heide A, van Leeuwen AF, Visser AP, Cleiren MP, Passchier J, van der Maas PJ. Positive and negative affect after diagnosis of advanced cancer. Psychooncology. 2005 Apr;14(4):262-73.

*301* - Adamina M
Adamina M, Gie O, Demartines N et al. Contemporary perioperative care strategies. The British journal of surgery. 2013;100(1):38-54 [link]

*302* - Ainsworth BE
Ainsworth BE, Haskell WL, Herrmann SD et al. 2011 Compendium of Physical Activities: a second update of codes and MET values. Medicine and science in sports and exercise. 2011;43(8):1575-81 [link]

*303* - Aguado Loi CX

Aguado Loi CX, Taylor TR, McMillan S et al. Use and helpfulness of self-administered stress management therapy in patients undergoing cancer chemotherapy in community clinical settings. J Psychosoc Oncol. 2012;30(1):57-80 [link]

*304* - Basen-Engquist K

Basen-Engquist K, Carmack CL, Li Y et al. Social-cognitive theory predictors of exercise behavior in endometrial cancer survivors. Health Psychol. 2013;32(11):1137-48 [link]

*305* - Belanger LJ
Belanger LJ, Plotnikoff RC, Clark AM et al. Determinants of physical activity in young adult cancer survivors. Am J Health Behav. 2012;36(4):483-94 [link]

*306* - Blaney JM

Blaney JM, Lowe-Strong A, Rankin-Watt J et al. Cancer survivors' exercise barriers, facilitators and preferences in the context of fatigue, quality of life and physical activity participation: a questionnaire-survey. Psycho-oncology. 2013;22(1):186-94 [link]]

*307* - Brunet J
Brunet J, Sabiston CM. Self-presentation and physical activity in breast cancer survivors: the moderating effect of social cognitive constructs. Journal of Sport & Exercise Psychology. 2011;33(6):759-78 [link]

*308* - Calfas KJ
Calfas KJ, Sallis JF, Zabinski MF et al. Preliminary evaluation of a multicomponent program for nutrition and physical activity change in primary care: PACE+ for adults. Prev Med. 2002;34(2):153-61 [link]

*309* - Carayol M
Carayol M, Bernard P, Boiche J et al. Psychological effect of exercise in women with breast cancer receiving adjuvant therapy: what is the optimal dose needed? Annals of oncology : official journal of the European Society for Medical Oncology / ESMO. 2013;24(2):291-300 [link]

*310* - Chandwani KD
Chandwani KD, Perkins G, Nagendra HR et al. Randomized, controlled trial of yoga in women with breast cancer undergoing radiotherapy. Journal of clinical oncology : official journal of the American Society of Clinical Oncology. 2014;32(10):1058-65 [link]

*311* - Chipperfield K

Chipperfield K, Fletcher J, Millar J et al. Factors associated with adherence to physical activity guidelines in patients with prostate cancer. Psycho-Oncology. 2013;22(11):2478-86 [link]]

*312* - Cohen J

Cohen J. Statistical power analysis for behavioral sciences. Second ed: Hillsdale, New Jersey; 1988. [link]

*313* - Courneya KS

Courneya KS, Jones LW, Peddle CJ et al. Effects of aerobic exercise training in anemic cancer patients receiving darbepoetin alfa: a randomized controlled trial. The oncologist. 2008;13(9):1012-20 [link]]

*314* - Cox CL

Cox CL, Montgomery M, Oeffinger KC et al. Promoting physical activity in childhood cancer survivors: results from the Childhood Cancer Survivor Study. Cancer. 2009;115(3):642-54 [link]

*315* - Cramp F
Cramp F, Daniel J. Exercise for the management of cancer-related fatigue in adults. The Cochrane database of systematic reviews. 2008(2):Cd006145 [link]

*316* - DCS.

DCS. Strategic presentation on cancer rehabilitation. 2010 [link]

*317* - Djuric Z
Djuric Z, Ellsworth JS, Weldon AL et al. A diet and exercise intervention during chemotherapy for breast cancer. The Open Obesity Journal. 2011;3:87-97 [link]

*318* - Dolan LB
Dolan LB, Gelmon K, Courneya KS et al. Hemoglobin and aerobic fitness changes with supervised exercise training in breast cancer patients receiving chemotherapy. Cancer Epidemiology, Biomarkers & Prevention. 2010;19(11):2826-32 [link]

*319* - Galway K

Galway K, Black A, Cantwell M et al. Psychosocial interventions to improve quality of life and emotional wellbeing for recently diagnosed cancer patients. Cochrane Database of Systematic Reviews [Internet]. 2012; (11). [link]

*320* - Gjerset GM
Gjerset GM, Fossa SD, Courneya KS et al. Interest and preferences for exercise counselling and programming among Norwegian cancer survivors. European journal of cancer care. 2011;20(1):96-105 [link]

*321* - Goedendorp Martine M

Goedendorp Martine M, Gielissen Marieke FM, Verhagen Constantijn A et al. Psychosocial interventions for reducing fatigue during cancer treatment in adults. Cochrane Database of Systematic Reviews [Internet]. 2009; (1). [link]

*322* - Goedendorp MM
Goedendorp MM, Gielissen MF, Verhagen CA et al. Development of fatigue in cancer survivors: a prospective follow-up study from diagnosis into the year after treatment. Journal of pain and symptom management. 2013;45(2):213-22 [link]

*323* - Goedendorp MM

Goedendorp MM, Peters MEWJ, Gielissen MFM et al. Is increasing physical activity necessary to diminish fatigue during cancer treatment? Comparing cognitive behavior therapy and a brief nursing intervention with usual care in a multicenter randomized controlled trial. The oncologist. 2010;15(10):1122-32 [link]

*324* - Cramp F, Byron-Daniel J.

Cramp F, Byron-Daniel J. Exercise for the management of cancer-related fatigue in adults. The Cochrane database of systematic reviews. 2012;11:Cd006145

*325* - Harrison S

Harrison S, Hayes SC, Newman B. Level of physical activity and characteristics associated with change following breast cancer diagnosis and treatment. Psycho Oncology. 2009;18(4):387-94 [link]

*326* - Hertogh EM
Hertogh EM, Schuit AJ, Peeters PH et al. Noncompliance in lifestyle intervention studies: the instrumental variable method provides insight into the bias. Journal of clinical epidemiology. 2010;63(8):900-6 [link]

*327* - Hsu H-T

Hsu H-T, Dodd MJ, Guo S-E et al. Predictors of exercise frequency in breast cancer survivors in Taiwan. Journal of clinical nursing. 2011;20(13-14):1923-35 [link]

*328* - Huy C

Huy C, Schmidt ME, Vrieling A et al. Physical activity in a German breast cancer patient cohort: One-year trends and characteristics associated with change in activity level. Eur J Cancer. 2012;48(3):297-304 [link]

*329* - Jones LW

Jones LW, Eves ND, Haykowsky M et al. Cardiorespiratory exercise testing in clinical oncology research: systematic review and practice recommendations. The lancet oncology. 2008;9(8):757-65 [link]

*330* - Karvinen KH

Karvinen KH, Courneya KS, Plotnikoff RC et al. A prospective study of the determinants of exercise in bladder cancer survivors using the Theory of Planned Behavior. Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer. 2009;17(2):171-9 [link]

*331* - Lerman Y
Lerman Y, Shemer J. Epidemiologic characteristics of participants and nonparticipants in health-promotion programs. Journal of occupational and environmental medicine / American College of Occupational and Environmental Medicine. 1996;38(5):535-8 [link]

*332* - Lucia A
Lucia A, Earnest C, Perez M. Cancer-related fatigue: can exercise physiology assist oncologists? The lancet oncology. 2003;4(10):616-25 [link]

*333* - McGowan EL

McGowan EL, Speed-Andrews AE, Rhodes RE et al. Sport participation in colorectal cancer survivors: an unexplored approach to promoting physical activity. Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer. 2013;21(1):139-47 [link]

*334* - Milne HM

Milne HM, Wallman KE, Guilfoyle A et al. Self-determination theory and physical activity among breast cancer survivors. Journal of Sport & Exercise Psychology. 2008;30(1):23-38 [link]

*335* - Minton O
Minton O, Stone P. A systematic review of the scales used for the measurement of cancer-related fatigue (CRF). Annals of oncology : official journal of the European Society for Medical Oncology / ESMO. 2009;20(1):17-25 [link]

*337* - Mishra SI
Mishra SI, Scherer RW, Snyder C et al. Exercise interventions on health-related quality of life for people with cancer during active treatment. The Cochrane database of systematic reviews. 2012;8:Cd008465 [link]

*338* - Ng AK

Ng AK, Li S, Recklitis C et al. Health Practice in Long-Term Survivors of Hodgkin's Lymphoma. Int J Radiat Oncol Biol Phys. 2008;71(2):468-76 [link]

*340* - Ng R

Ng R, Pond GR, Tang PA et al. Correlation of changes between 2-year disease-free survival and 5-year overall survival in adjuvant breast cancer trials from 1966 to 2006. Annals of oncology : official journal of the European Society for Medical Oncology / ESMO. 2008;19(3):481-6 [link]

*341* - PACE

PACE. PACE vragenlijst Available from: [link]

*342* - Peddle CJ

Peddle CJ, Plotnikoff RC, Wild TC et al. Medical, demographic, and psychosocial correlates of exercise in colorectal cancer survivors: an application of self-determination theory. Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer. 2008;16(1):9-17 [link]

*343* - Persoon S
Persoon S, Kersten MJ, van der Weiden K et al. Effects of exercise in patients treated with stem cell transplantation for a hematologic malignancy: a systematic review and meta-analysis. Cancer Treatment Reviews 2013 Oct;39(6):682-690. 2013 [link]

*344* - Petrella RJ

Petrella RJ, Lattanzio CN. Does counseling help patients get active? Systematic review of the literature. Canadian family physician Medecin de famille canadien. 2002;48:72-80 [link]

*345* - Pettersson A
Pettersson A, Johansson B, Persson C et al. Effects of a dietary intervention on acute gastrointestinal side effects and other aspects of health-related quality of life: a randomized controlled trial in prostate cancer patients undergoing radiotherapy. Radiotherapy and oncology : journal of the European Society for Therapeutic Radiology and Oncology. 2012;103(3):333-40 [link]

*346* - Riebe D
Riebe D, Franklin BA, Thompson PD et al. Updating ACSM's Recommendations for Exercise Preparticipation Health Screening. Medicine and science in sports and exercise. 2015;47(11):2473-9 [link]

*347* - Schmitz KH
Schmitz KH, Courneya KS, Matthews C et al. American College of Sports Medicine roundtable on exercise guidelines for cancer survivors. Medicine and science in sports and exercise. 2010;42(7):1409-26 [link]

*348* - Soerjomataram I

Soerjomataram I, Thong MSY, Korfage IJ et al. Excess weight among colorectal cancer survivors: Target for intervention. J Gastroenterol. 2012;47(9):999-1005 [link]

*349* - Speed-Andrews AE

Speed-Andrews AE, Rhodes RE, Blanchard CM et al. Medical, demographic and social cognitive correlates of physical activity in a population-based sample of colorectal cancer survivors. European journal of cancer care. 2012;21(2):187-96 [link]

*350* - Stevinson C
Stevinson C, Tonkin K, Capstick V et al. A population-based study of the determinants of physical activity in ovarian cancer survivors. J Phys Act Health. 2009;6(3):339-46 [link]

*351* - Trinh L
Trinh L, Plotnikoff RC, Rhodes RE et al. Correlates of physical activity in a population-based sample of kidney cancer survivors: an application of the theory of planned behavior. The international journal of behavioral nutrition and physical activity. 2012;9(96) [link]

*352* - Tuinman MA
Tuinman MA, Gazendam-Donofrio SM, Hoekstra-Weebers JE. Screening and referral for psychosocial distress in oncologic practice: use of the Distress Thermometer. Cancer. 2008;113(4):870-8 [link]

*353* - Vallance JK

Vallance JK, Lavallee C, Culos-Reed NS et al. Predictors of physical activity among rural and small town breast cancer survivors: an application of the theory of planned behaviour. Psychology, health & medicine. 2012;17(6):685-97 [link]

*354* - van Engen-Verheul M
van Engen-Verheul M, de Keizer N, Hellemans I et al. Design of a continuous multifaceted guideline-implementation strategy based on computerized decision support. Studies in health technology and informatics. 2010;160(Pt 2):836-40 [link]

*355* - Velthuis MJ
Velthuis MJ, Agasi-Idenburg SC, Aufdemkampe G et al. The effect of physical exercise on cancer-related fatigue during cancer treatment: a meta-analysis of randomised controlled trials. Clinical oncology (Royal College of Radiologists (Great Britain)). 2010;22(3):208-21 [link]

*356* - Wasserman KH

Wasserman KH, J.E. Exercise testing and Interpretation, 5th Revised edition: Lippincott Williams And

Wilkins; 2011 [link]

*357* - Wenzel JA

Wenzel JA, Griffith KA, Jingjing S et al. Impact of a Home-Based Walking Intervention on Outcomes of Sleep Quality, Emotional Distress, and Fatigue in Patients Undergoing Treatment for Solid Tumors. The oncologist. 2013;18(4):476-84 [link]

*358* - Yang H-K
Yang H-K, Shin D-W, Park J-H et al. The association between perceived social support and continued smoking in cancer survivors. Japanese journal of clinical oncology. 2013;43(1):45-54 [link]

*359* - Bjorneklett HG

Bjorneklett HG, Rosenblad A, Lindemalm C et al. A randomized controlled trial of support group intervention after breast cancer treatment: results on sick leave, health care utilization and health economy. Acta oncologica (Stockholm, Sweden). 2013;52(1):38-47 [link]

*360* - Burgio KL
Burgio KL, Goode PS, Urban DA et al. Preoperative biofeedback assisted behavioral training to decrease post-prostatectomy incontinence: a randomized, controlled trial. The Journal of urology. 2006;175(1):196-201; discussion [link]

*361* - De Boer AG

De Boer AG, Taskila T, Tamminga SJ et al. Interventions to enhance return-to-work for cancer patients. Cochrane Database of Systematic Reviews. 2011;2(2):CD007569 [link]

*362* - Egan MY

Egan MY, McEwen S, Sikora L et al. Rehabilitation following cancer treatment [with consumer summary]. Disability and Rehabilitation 2013;35(26):2245-2258. 2013 [link]

*363* - Hubbard G
Hubbard G, Gray NM, Ayansina D et al. Case management vocational rehabilitation for women with breast cancer after surgery: a feasibility study incorporating a pilot randomised controlled trial. Trials. 2013;14:175 [link]

*364* - Maguire P
Maguire P, Brooke M, Tait A et al. The effect of counselling on physical disability and social recovery after mastectomy. Clin Oncol. 1983;9(4):319-24 [link]

*365* - Riebe D
Riebe D, Franklin BA, Thompson PD et al. Updating ACSM's Recommendations for Exercise Preparticipation Health Screening. Med Sci Sports Exerc. 2015;47(11):2473-9 [link]

*366* - Sherman DW
Sherman DW, Haber J, Hoskins CN et al. The effects of psychoeducation and telephone counseling on the adjustment of women with early-stage breast cancer. Applied nursing research : ANR. 2012;25(1):3-16 [link]

*367* - Tamminga S

Tamminga S, Verbeek J, Frings-Dresen M et al. Effectiveness of a hospital-based work support intervention for cancer patients-a multi-centre randomised controlled trial. Psycho-Oncology. 2013;22:108 [link]

*368* - Tamminga SJ
Tamminga SJ, de Boer AG, Verbeek JH et al. Return-to-work interventions integrated into cancer care: a systematic review. Occupational and environmental medicine. 2010;67(9):639-48 [link]

*369* - Arving C
Arving C, Brandberg Y, Feldman I et al. Cost-utility analysis of individual psychosocial support interventions for breast cancer patients in a randomized controlled study. Psycho-oncology. 2014;23(3):251-8 [link]

*370* - Bjorneklett HG
Bjorneklett HG, Rosenblad A, Lindemalm C et al. A randomized controlled trial of support group intervention after breast cancer treatment: results on sick leave, health care utilization and health economy. Acta Oncol. 2013;52(1):38-47 [link]

*371* - Bradley A
Bradley A, Marshall A, Stonehewer L et al. Pulmonary rehabilitation programme for patients undergoing curative lung cancer surgery. Eur J Cardiothorac Surg. 2013;44(4):e266-71 [link]

*372* - Brink-Muinen d
Brink-Muinen d. Oog voor communicatie huisarts-patiënt : communicatie in Nederland. 2004 [link]

*373* - DCS

DCS. Strategic presentation on cancer rehabilitation. 2010 [link]

*374* - Farquhar MC
Farquhar MC, Prevost A, McCrone P et al. Is a specialist breathlessness service more effective and cost-effective for patients with advanced cancer and their carers than standard care? Findings of a mixed-method randomised controlled trial. BMC Med. 2014;12(1):194 [link]

*375* - Gordon LG
Gordon LG, Scuffham P, Battistutta D et al. A cost-effectiveness analysis of two rehabilitation support services for women with breast cancer. Breast cancer research and treatment. 2005;94(2):123-33 [link]

*376* - Haines TP
Haines TP, Sinnamon P, Wetzig NG et al. Multimodal exercise improves quality of life of women being treated for breast cancer, but at what cost? Randomized trial with economic evaluation. Breast cancer research and treatment. 2010;124(1):163-75 [link]

*377* - Hollingworth W
Hollingworth W, Metcalfe C, Mancero S et al. Are needs assessments cost effective in reducing distress among patients with cancer? A randomized controlled trial using the Distress Thermometer and Problem List. Journal of clinical oncology : official journal of the American Society of Clinical Oncology. 2013;31(29):3631-8 [link]

*378* - Jones L
Jones L, Fitzgerald G, Leurent B et al. Rehabilitation in advanced, progressive, recurrent cancer: a randomized controlled trial. Journal of Pain & Symptom Management. 2013;46(3):315-25.e3 [link]

*379* - Lemieux J
Lemieux J, Topp A, Chappell H et al. Economic analysis of psychosocial group therapy in women with metastatic breast cancer. Breast cancer research and treatment. 2006;100(2):183-90 [link]

*380* - Mandelblatt JS
Mandelblatt JS, Cullen J, Lawrence WF et al. Economic evaluation alongside a clinical trial of psycho-educational interventions to improve adjustment to survivorship among patients with breast cancer. Journal of clinical oncology : official journal of the American Society of Clinical Oncology. 2008;26(10):1684-90 [link]

*381* - Mewes JC
Mewes JC, Steuten LM, Duijts SF et al. Cost-effectiveness of cognitive behavioral therapy and physical exercise for alleviating treatment-induced menopausal symptoms in breast cancer patients. Journal of cancer survivorship : research and practice. 2014 [link]

*382* - Mewes JC
Mewes JC, Steuten LM, Ijzerman MJ et al. Effectiveness of multidimensional cancer survivor rehabilitation and cost-effectiveness of cancer rehabilitation in general: a systematic review. The oncologist. 2012;17(12):1581-93 [link]

*383* - Mourgues C
Mourgues C, Gerbaud L, Leger S et al. Positive and cost-effectiveness effect of spa therapy on the resumption of occupational and non-occupational activities in women in breast cancer remission: a French multicentre randomised controlled trial. Eur J Oncol Nurs. 2014;18(5):505-11 [link]

*384* - Retel VP
Retel VP, van der Molen L, Hilgers FJ et al. A cost-effectiveness analysis of a preventive exercise program for patients with advanced head and neck cancer treated with concomitant chemo-radiotherapy. BMC cancer. 2011;11:475 [link]

*385* - Round J
Round J, Leurent B, Jones L. A cost-utility analysis of a rehabilitation service for people living with and beyond cancer. BMC Health Serv Res. 2014;14(1):558 [link]

*386* - Sabariego C
Sabariego C, Brach M, Herschbach P et al. Cost-effectiveness of cognitive-behavioral group therapy for dysfunctional fear of progression in cancer patients. Eur J Health Econ. 2011;12(5):489-97 [link]

*387* - Stam J Veld

Stam J Veld, K in 't. Het einde is in zicht. Over begeleiding naar het levenseinde. Cahiers over communicatie en attitude. 2001

*388* - Tamminga S
Tamminga S, Verbeek J, Frings-Dresen M et al. Effectiveness of a hospital-based work support intervention for cancer patients-a multi-centre randomised controlled trial. Psycho-Oncology. 2013;22:108 [link]

*389* - Arving C
Arving C, Brandberg Y, Feldman I et al. Cost-utility analysis of individual psychosocial support interventions for breast cancer patients in a randomized controlled study. Psycho-oncology. 2014;23(3):251-8 [link]

*390* - Bjorneklett HG
Bjorneklett HG, Rosenblad A, Lindemalm C et al. A randomized controlled trial of support group intervention after breast cancer treatment: results on sick leave, health care utilization and health economy. Acta Oncol. 2013;52(1):38-47 [link]

*391* - Bradley A
Bradley A, Marshall A, Stonehewer L et al. Pulmonary rehabilitation programme for patients undergoing curative lung cancer surgery. Eur J Cardiothorac Surg. 2013;44(4):e266-71 [link]

*392* - Brink-Muinen d
Brink-Muinen d. Oog voor communicatie huisarts-patiënt : communicatie in Nederland. 2004 [link]

*393* - DCS
DCS. Strategic presentation on cancer rehabilitation. 2010 [link]

*394* - Farquhar MC
Farquhar MC, Prevost A, McCrone P et al. Is a specialist breathlessness service more effective and cost-effective for patients with advanced cancer and their carers than standard care? Findings of a mixed-method randomised controlled trial. BMC Med. 2014;12(1):194 [link]

*395* - Gordon LG
Gordon LG, Scuffham P, Battistutta D et al. A cost-effectiveness analysis of two rehabilitation support services for women with breast cancer. Breast cancer research and treatment. 2005;94(2):123-33 [link]

*396* - Haines TP
Haines TP, Sinnamon P, Wetzig NG et al. Multimodal exercise improves quality of life of women being treated for breast cancer, but at what cost? Randomized trial with economic evaluation. Breast cancer research and treatment. 2010;124(1):163-75 [link]

*397* - Hollingworth W
Hollingworth W, Metcalfe C, Mancero S et al. Are needs assessments cost effective in reducing distress among patients with cancer? A randomized controlled trial using the Distress Thermometer and Problem List. Journal of clinical oncology : official journal of the American Society of Clinical Oncology. 2013;31(29):3631-8 [link]

*398* - Jones L
Jones L, Fitzgerald G, Leurent B et al. Rehabilitation in advanced, progressive, recurrent cancer: a randomized controlled trial. Journal of Pain & Symptom Management. 2013;46(3):315-25.e3 [link]

*399* - Lemieux J
Lemieux J, Topp A, Chappell H et al. Economic analysis of psychosocial group therapy in women with metastatic breast cancer. Breast cancer research and treatment. 2006;100(2):183-90 [link]

*400* - Mandelblatt JS
Mandelblatt JS, Cullen J, Lawrence WF et al. Economic evaluation alongside a clinical trial of psycho-educational interventions to improve adjustment to survivorship among patients with breast cancer. Journal of clinical oncology : official journal of the American Society of Clinical Oncology. 2008;26(10):1684-90 [link]

*401* - Mewes JC
Mewes JC, Steuten LM, Duijts SF et al. Cost-effectiveness of cognitive behavioral therapy and physical exercise for alleviating treatment-induced menopausal symptoms in breast cancer patients. Journal of cancer survivorship : research and practice. 2014 [link]

*402* - Mewes JC
Mewes JC, Steuten LM, Ijzerman MJ et al. Effectiveness of multidimensional cancer survivor rehabilitation and cost-effectiveness of cancer rehabilitation in general: a systematic review. The oncologist. 2012;17(12):1581-93 [link]

*403* - Mourgues C
Mourgues C, Gerbaud L, Leger S et al. Positive and cost-effectiveness effect of spa therapy on the resumption of occupational and non-occupational activities in women in breast cancer remission: a French multicentre randomised controlled trial. Eur J Oncol Nurs. 2014;18(5):505-11 [link]

*404* - Retel VP
Retel VP, van der Molen L, Hilgers FJ et al. A cost-effectiveness analysis of a preventive exercise program for patients with advanced head and neck cancer treated with concomitant chemo-radiotherapy. BMC cancer. 2011;11:475 [link]

*405* - Round J
Round J, Leurent B, Jones L. A cost-utility analysis of a rehabilitation service for people living with and beyond cancer. BMC Health Serv Res. 2014;14(1):558 [link]

*406* - Sabariego C
Sabariego C, Brach M, Herschbach P et al. Cost-effectiveness of cognitive-behavioral group therapy for dysfunctional fear of progression in cancer patients. Eur J Health Econ. 2011;12(5):489-97 [link]

*407* - Stam J Veld

Stam J Veld, K in 't. Het einde is in zicht. Over begeleiding naar het levenseinde. Cahiers over communicatie en attitude. 2001

*408* - Tamminga S

Tamminga S, Verbeek J, Frings-Dresen M et al. Effectiveness of a hospital-based work support intervention for cancer patients-a multi-centre randomised controlled trial. Psycho-Oncology. 2013;22:108 [link]

*409* - Zorginstituut Nederland
Zorginstituut Nederland, Standpunt medisch-specialistische revalidatie (2015), Standpunt medisch-specialistische revalidatie - zorg zoals revalidatieartsen plegen te bieden, 2015

# Appendices

*1. Clinical problem analysis*
Various clinical problem analyzes were carried out in 2008 and 2011. Download the results for 2011 below:

Results clinical problem analysis specialised medical rehabilitation in oncology professionals 2011
Results clinical problem analysis specialised medical rehabilitation in oncology patients 2011

The online questionnaire was opened on 3 October 2008 and closed on 6 November 2008. The questionnaire was distributed amongst the following professionals:

Leden van onderstaande wetenschappelijke- en beroepsverenigingen:

- Koninklijk Nederlandse Genootschap voor Fysiotherapie (KNGF)
- Nederlands Huisartsen Genootschap (NHG)
- Nederlandse Vereniging voor Heelkunde (NVvH)
- Nederlandse Vereniging voor Medische Oncologie (NVMO)
- Nederlandse Vereniging voor Psychosociale Oncologie (NVPO)
- Nederlands Instituut voor Psychologen (NIP)
- Nederlandse Vereniging voor Radiotherapie en Oncologie (NVRO)
- Verpleegkundigen en Verzorgenden Nederland Oncologie (V&VN Oncologie)
- Nederlandse Vereniging van Revalidatieartsen (VRA)
- Nederlandse Vereniging voor Arbeids- en Bedrijfsgeneeskunde (NVAB)
- Nederlandse Vereniging voor Fysiotherapie binnen de Lymfologie (NVFL)
- Ergotherapie Nederland (EN)
- Nederlandse Vereniging voor Chirurgische Oncologie (NVCO)
- Revalidatie Nederland (RN)
- Vereniging voor Sportgeneeskunde (VSG)
- Nederlandse Vereniging voor Verzekeringsgeneeskunde (NVVG)

Members of national and regional working groups and networks of the ACCC:

- CCCN, Rotterdam: Herstel & Balans (a group rehabilitation programme), Physiotherapists, Psychologists, Social Workers, Surgeons, Radiotherapists, Internist-oncologists, Coordinating Oncology Nurses, Mammary care nurses
- CCCN Utrecht: Herstel & Balans, Physiotherapists, Psychologists-psychotherapists, KPO-WPO (Psychologists/Social workers), Surgeons, ROOV (Oncology nurses), Task group Mamma care, hospital social work, palliative care, Mamma carcinoma, Gastro-enterology, Lung, Haematology, Thyroid, Soft tissue tumours
- CCCN: physiotherapists, staff involved with Herstel & Balans, via AGORA and Palliative care department of the CCCN to professionals working in palliative care

A total of 691 respondents completed the questionnaire. A total of 190 questionnaires were not included in the definitive analysis: CCCN staff member (n=8), no patients with cancer in their practice (n=40), did not tick any clinical problems or name extra clinical problems or made any comments (n=142). Questionnaires from 501 respondents were included in the analysis.
An overview of the disciplines and workplace of the respondents can be found in **Table 1**.

***Table 1. Questionnaire data from respondents for clinical problem inventory***

| ***Respondents*** | **•1.1 Number** |
|---|---|
| Total | 501 |
| **Care setting** | |
| Hospital | 244 |
| Private/Group practice | 193 |
| Rehabilitation centre | 27 |
| Rest home/Nursing home/Hospice | 12 |

| | |
|---|---|
| GGZ (the Dutch Association for Mental Health) | 4 |
| Sport Medical Centre | 4 |
| Home care | 4 |
| Arbodienst (Occupational Health and Safety Service) | 3 |
| IPSO (Institutions for Psychosocial Oncology) | 3 |
| Other | 7 |
| **Occupational group** | |
| Paramedical (Para) | 215 |
| Psychosocial (Psycho) | 117 |
| Medical | 98 |
| Nurse (Nurse) | 65 |
| Advisor/Policy staff member | 3 |
| Other | 3 |
| **Paramedical specialism** | |
| Physiotherapist (Physio) (oedema therapist, oncological background) | 208 |
| Exercise agogist | 3 |
| Manual therapist | 2 |
| Other | 2 |
| **Psychosocial specialism** | |
| Psychologist (Psygist) | 93 |
| Social worker (SW) | 15 |
| Psychotherapist | 8 |
| Other | 1 |
| **Medical specialism** | |
| Radiotherapist (Radio) | 31 |
| Surgeon | 19 |
| Sports medicine (Sport) | 16 |
| Rehabilitation medicine (Reh) | 15 |
| Internist | 5 |
| Other | 12 |
| **Number of patients with cancer per year** | |
| More than 50 | 199 |
| 10-25 | 118 |
| 25-50 | 93 |
| 1-10 | 91 |
| *None* | *40 (not included)* |
| **Familiar with cancer rehabilitation** | |
| Yes | 390 |
| No | 111 |

**Table 2** shows an overview of the prioritised clinical problems. All respondents together (All), a selection of paramedical disciplines (Para), selection of psychosocial disciplines (Psycho), selection of medical disciplines (medical) and selection of nursing disciplines (Nurse). The *first* number indicates the order of rank (the smaller the number (1), the more often prioritised; the bigger the number (6), the less often prioritised). The *second* number with a number after the comma indicates the percentage (the bigger the number, the more respondents found this an important clinical problem). The clinical problem that was *most often prioritised* per discipline is shown with a bigger letter type that is in bold.

***Table 2. Clinical problems prioritised by respondents (per discipline)***

| **Clinical problems: I am not aware.....** | **All** N=501 | **Para** 215 | **Psycho** 117 | **Medical** 98 | **Nurse** 65 |
|---|---|---|---|---|---|
| • 1. Which specific complaints occur **during** treatment with curative intent, with which diagnosis and associated | **12*** 15.8 | **11** 17.5 | **11** 22.6 | **12** 10.4 | **12** 4.6 |

| | | | | | |
|---|---|---|---|---|---|
| treatment | | | | | |
| • 2. Which specific residual complaints occur **after completing** treatment with curative intent, with which diagnosis and associated treatment | **10** 22.5 | **8** 21.3 | **8** 31.3 | **11** 20.8 | **11** 12.3 |
| • 3. Which specific complaints occur often in the stable **palliative phase**, with which diagnosis and associated treatment | **11** 18.7 | **10** 19.4 | **9** 28.7 | **13** 8.3 | **10** 13.8 |
| • 4. Which form of rehabilitation **during** treatment with curative intent for which patient is the most suitable to reduce or prevent complaints | **6** 31.8 | **7** 23.7 | **3** 35.7 | **6** 38.5 | **5** 43.1 |
| • 5. Which form of rehabilitation **after completing** treatment with curative intent for which patient is the most suitable to reduce specific complaints | **8** 28.6 | **9** 19.0 | **6** 30.4 | **4** 44.8 | **9** 32.3 |
| • 6. Which form of rehabilitation in the stable **palliative phase** for which patient is the most suitable to reduce or prevent specific complaints | **7** 31.4 | **5** 28.4 | **6** 30.4 | **8** 28.1 | **3** 49.2 |
| • 7. Whether and which form of rehabilitation **during and after completing** treatment with curative intent can lead to reduced absence from work through illness/improved participation in the workforce | **7** 31.4 | **6** 24.2 | **7** 33.0 | **5** 40.6 | **6** 41.5 |
| • 8. Whether and which form of rehabilitation in the stable **palliative phase** can lead to longer participation in the workforce | **9** 26.0 | **7** 23.7 | **10** 27.0 | **10** 21.9 | **7** 38.5 |
| • 9. Which screening instruments can detect specific complaints **during and after completing** treatment with curative intent | **1** **54.2** | **1** **60.2** | **1** **42.6** | **1** **59.4** | **2** 50.8 |
| • 10. Which screening instruments can be used to screen for specific complaints in the stable **palliative phase** | **3** 42.8 | **2** 50.7 | **2** 39.1 | **7** 29.2 | **4** 44.6 |
| • 11. Which measuring instruments are suitable to measure the effect of cancer rehabilitation on specific complaints **during and after completing** treatment with curative intent | **2** 43.4 | **3** 48.3 | **4** 34.8 | **3** 45.8 | **6** 41.5 |
| • 12. Which measuring instruments are suitable to measure the effect of cancer rehabilitation on specific | **5** 38.3 | **3** 48.3 | **5** 33.9 | **9** 24.0 | **8** 35.4 |

| | | | | | |
|---|---|---|---|---|---|
| complaints in the stable **palliative phase** | | | | | |
| • 13. What the intake should consist of in order to determine which form of rehabilitation is the most suitable for a specific patient | **4** 40.6 | **4** 35.5 | **6** 30.4 | **2** 51.0 | **1** **61.5** |

In total, 18.9% (i.e. 95 of the 501 respondents) mentioned an extra clinical problem as a result of the questionnaire. In one case, this 'extra' clinical problem concerned a clinical problem that was already on the clinical problem list; here the relevant *clinical problem number (#..)* has been noted.

In summary, the extra clinical problems mentioned include the following (the number of respondents mentioning each clinical problem is shown in brackets):

- Determining the individual load capacity, comorbidity, overlap interventions, treatment and rehabilitation (n=15)
- Tailoring (per cancer type, rehabilitation tailored to type of patient), rehabilitation programme during treatment - after completing treatment - in palliative phase (#4, #5, #6, n=14)
- Intake, decision tree, attention for personality factors (#13, n=13)
- Rehabilitation in care path, community resources, multidisciplinary care (n=12)
- Availability of rehabilitation, referral to rehabilitation, unknown (n=10)
- Attention for psychosocial care (n=7)
- Providing information, collaboration, alignment amongst healthcare providers, communication (n=6)
- Lymphoedema (n=5)
- Guidance, aftercare (n=4)
- Red flags during rehabilitation: when to refer the patient to a physician (n=4)
- Finance (n=3)
- Children, young people (n=2)
- Measuring instruments (#11, #12, n=2)
- Rehabilitation in non-stable palliative phase (n=1)
- Rehabilitation for people with metastases (n=1)
- Menopausal complaints (n=1)
- Polyneuropathy (n=1)
- Fatigue (n=1)
- Independent in traffic (n=1)
- Change in weight (composition) - information about diet (n=1)
- Group discussions (n=1)

The project group has made a selection of the ten most important clinical problems on the basis of the input from the clinical problem inventory amongst professionals and from the Interactive work conference with (ex)patients with cancer (see Appendix 2). It must be said that the clinical problems indicated by (ex)patients with cancer aligned well with the clinical problems mentioned by the professionals.

The guideline 'Cancer rehabilitation' could be developed on the basis of a subsidy provided by The Netherlands Organisation for Health Research and Development (ZonMw). Conditions stipulated by ZonMw that had to be met were:

1. One clinical problem must be derived from the patient perspective
2. One clinical problem must highlight the topic work reintegration and social participation, and
3. Two clinical problems must specifically concern the palliative phase of the disease.

All thirteen clinical problems as stated above in Table 2 were selected to be covered in the guideline. Some clinical problems were combined by covering different disease phases simultaneously. This was the case for clinical problem #1 and #2 (complaints during and after completing treatment), #7 and #8 (rehabilitation and resuming work/participation in society for all disease phases), #9 and #10 (screening of complaints in all disease phases), #11 and #12 (measuring instruments for rehabilitation effect evaluation in all disease phases). As the tenth clinical problem, the clinical problem put forward from a patient perspective (empowerment) was added. The ten selected clinical problems were subsequently formulated as clinical questions (see Appendix 3). Tailored healthcare - a wish from the patient perspective - is the

common theme in the guideline.

*2. Interactice work conference*

Introduction

For input in the guideline ‘Cancer rehabilitation' from a patient perspective, an interactive work conference was organised on 18 November 2008 with support by mr. G. Muller. During this conference, (ex)patients with cancer and professionals exchanged ideas about the theme cancer rehabilitation. On the basis of their own experience, (ex)patients indicated what they felt should receive attention in the guideline ‘Cancer rehabilitation'. Below is a report of this meeting. The input from these (ex)patients has been included when selecting the maximum ten clinical problems to be covered in this guideline.

Participants

The participants in the work conference were approached via various channels:

- The NFK (Dutch Federation of Cancer Patient Associations)
- The ROOV (Regional Consultation of Oncology Nurses) of the CCCN (Comprehensive Cancer Centre the Netherlands)
- The Herstel & Balans (a group rehabilitation programme) in the CCCN location Utrecht and Tergooi Hospitals (location Zonnestraal) in Hilversum
- The patient platform of the Comprehensive Cancer Centre South
- Ms. E. de Nijs, MSc. and Dr. A. de Graeff (nurse and internist-oncologist, both working at the UMC Utrecht)

A total of 17 (ex)patients with cancer and 5 health healthcare providers participated in the interactive work conference. Characteristics of the (ex)patients are shown in **Table 1**. The majority of participants were female (n=14 (82%)) and (had been) diagnosed with breast cancer (n=10 (59%)). The (ex)patients received curative (n=14 (82%)) as well as palliative (n=3 (18%)) treatment. The total number of (ex)patients with cancer participating in the interactive work conference was relatively small. The method and time duration (an entire afternoon) enabled a lot of beneficial information to be gained from the (ex)patients despite the relatively small number present.

**Table 1. Characteristics of (ex)patients participating in the work conference (N=17)**

| | |
|---|---|
| Average age in years (range) | 52 (39-67) |
| Women: number (%) | 14 (82%) |
| Cancer diagnosis: number (%)<br>mamma<br>colon<br>Ewing's sarcoma<br>non-Hodgkin<br>ovarian | <br>10 (59%)<br>2 (12%)<br>1 (6%)<br>2 (12%)<br>2 (12%) |
| Number of years since diagnosis<br>0-2 years<br>2-5 years<br>> 5 years | <br>12 (71%)<br>2 (12%)<br>3 (18%) |
| Currently still in treatment: number (%) | 8 (47%) |
| Treatment intent<br>Curative<br>Palliative | <br>14 (82%)<br>3 (18%) |
| Experience with rehabilitation: number (%) | 15 (88%) |
| Member of patient association: number (% ) | 5 (29%) |

In total, a small group of 5 healthcare providers participated in the interactive work conference: one physiotherapist, one psychologist, one internist-oncologist, one rehabilitation doctor and one radiotherapist. The rehabilitation doctor is a member of the ‘Cancer rehabilitation' guideline development group. The group of healthcare providers has been kept purposefully small given the number of (ex)patients participating in the interactive work conference is relatively small.

Method

The group was subdivided into three groups in advance. Each subgroup consisted of five or six (ex) patients and one or two healthcare providers. An effort was made to have (ex)patients with different characteristics represented in each group.

The subgroup visited three stations corresponding to the three phases of the cancer treatment and care process:

1. During cancer treatment with curative intent
2. After cancer treatment with curative intent, and
3. In the palliative phase, when treatment is not longer aimed at curation

The subgroup received a number of assignments at each station. Firstly, participants were individually asked to note down their wishes and suggestions in relation to rehabilitation in the relevant phase. The members of the group (first the patients, then the healthcare providers) subsequently presented their wishes and suggestions to each other and there was an opportunity to respond to each other's wishes and suggestions. Participants were then asked to provide additional comments and suggestions for adjustments for clinical problems indicated by the professionals in the questionnaire. The round was closed after half an hour and the subgroup moved on to the following station. This was repeated three times, until each subgroup had visited each station.

To complete the conference, a final round was held in which each participant was asked to verbally provide an answer to the question ‘What do we need to take into consideration in development of the guideline'.

Results

The most important results of the interactive work conference are provided below, first results for the three stations, followed by answers for the final question.

*The three stations*

*Rehabilitation during treatment with curative intent*

The wishes and suggestions put forward by participants are shown in **Table 2**. The following three items were the most commonly put forward:

1. tailored healthcare, training adjusted to the condition and possibilities of the patient and taking the effects of treatment into account (mentioned twelve times)
2. information about exercise at home (mentioned six times), and
3. physical training, mainly consisting of fitness and strength training (mentioned fourteen times)

**Table 2. Wishes and suggestions in relation to cancer rehabilitation during treatment with curative intent**

| | **Total** | **Patient** | **Professional** |
|---|---|---|---|
| **Information** | **n=17*** | **n=12** | **n=5** |
| Information about patient organisations/other institutions | 2 | 2 | 0 |
| Information regarding treatment/course/recovery/possible obstacles | 4 | 3 | 1 |
| Information about the importance of exercise | 5 | 3 | 2 |
| Practical tips for moving/doing sports at home, moving even though you do not feel well, one per day | 6 | 4 | 2 |
| **Cancer Rehabilitation, Organization** | **33** | **25** | **8** |
| Tailored healthcare | 12^ | 8 | 4 |
| • Adjusted to condition/level/possibilities | *5* | *4* | *1* |
| • Taking the effects of treatment into account | *3* | *0* | *3* |
| • Tailoring in general (format, individual/group) | *4* | *4* | *0* |
| Contact with fellow patients | 4 | 3 | 1 |
| Logistics | 10 | 8 | 2 |

| | | | |
|---|---|---|---|
| • Centering help, various experts together | *1* | *1* | *0* |
| • Aligning with regularity of treatment courses | *1* | *1* | *0* |
| • Exercise in group format | *2* | *2* | *0* |
| • Ability to walk-in | *1* | *0* | *1* |
| • Guidance close to home / accessibility / availability | *3* | *3* | *0* |
| • Affordability/financing | *2* | *1* | *1* |
| Moment of service provision/format | 7 | 6 | 1 |
| • Providing rehabilitation early, from the start of treatment or even already before treatment by the physician or nurse / direct after OK | *4* | *3* | *1* |
| • Focus on rehabilitation after completing treatment process | *2* | *2* | *0* |
| • Broad setup, not only Herstel & Balans (a group rehabilitation programme) | *1* | *1* | *0* |
| **Cancer rehabilitation, guidance** | **23** | **21** | **2** |
| Providers/Contents of Cancer Rehabilitation | 14 | 12 | 2 |
| • Physiotherapy | *2* | *2* | *0* |
| • Specialised treatment setting with dietician, ergotherapist, psychologist, physical training and psychosocial training | *1* | *0* | *1* |
| • Make psychological support and physiotherapy a separate module | *1* | *1* | *0* |
| • Psychosocial guidance | *5* | *5* | *0* |
| • Dietary advice/dietician | *5* | *4* | *1* |
| Guidance in task/role/points of attention | 9 | 9 | 0 |
| • Being available for questions | *1* | *1* | *0* |
| • Helping to solve problems and clinical problems | *1* | *1* | *0* |
| • Providing physical/emotional support | *1* | *1* | *0* |
| • Guidance with exercise | *1* | *1* | *0* |
| • Regular contact | *1* | *1* | *0* |
| • Positive stimulation, even if you're tired | *1* | *1* | *0* |
| • Involving the environment | *1* | *1* | *0* |
| • Attention for work, discuss with occupational physician what is required for work | *1* | *1* | *0* |
| • Attention for the complaints of the patient | *1* | *1* | *0* |

| **Physical Training / Rehabilitation** | **14** | **11** | **3** |
|---|---|---|---|
| Fitness training/maintaining fitness | 7 | 5 | 2 |
| Strength training | 3 | 3 | 0 |
| Explanation of what effect sport has on the body | 1 | 1 | 0 |
| Rehabilitation after breast OR, mobilisation of tissue, muscle strength shoulder muscles | 3 | 2 | 1 |
| **Interventions - other** | **6** | **2** | **4** |
| Massage | 1 | 0 | 1 |
| Body-focused interventions, including breath awareness technique | 1 | 0 | 1 |
| Lifestyle advice, 24 hour rhythm, sleep advice, guidance of environment | 1 | 0 | 1 |
| Relaxation therapy | 1 | 0 | 1 |
| Tape treatment for nausea | 1 | 1 | 0 |
| Alternative medicine | 1 | 1 | 0 |
| **Research** | **5** | **0** | **5** |
| Measure effects of rehabilitation / scientific support needed | 3 | 0 | 3 |
| Inventory of needs and possibilities for cancer rehabilitation | 2 | 0 | 2 |
| **Other** | **5** | **2** | **3** |
| On a psychological level, exercise can literally help to bring about movement | 1 | 0 | 1 |
| Achieving the end of treatment is the most important thing for the medical specialist; this can come about through medication and, in addition, possibly with cancer rehabilitation | 1 | 0 | 1 |
| Fatigue is usually not yet in the foreground during treatment | 1 | 0 | 1 |
| Stichting Tegenkracht Amsterdam (a non-profit organisation that facilitates physical training for cancer patients) helps with rehabilitation/sport in your area | 1 | 1 | 0 |
| Leave the pure medical approach behind | 1 | 1 | 0 |

* total score of items stated under the bolded heading
^ total score of the items (with bullet point) stated under the subheading

Patients indicated they had difficulty with the question in which they were asked to indicate additional clinical problems experienced by professionals during cancer treatment. If they nonetheless had to choose a clinical problem, only ‘It is unknown which specific complaints occur during the treatment with curative intent (with which diagnosis and which treatment)' appeared relevant to them for the patient. As nuance, they mentioned that complaints are accepted during treatment, in contrast to after treatment has been completed.

*Rehabilitation after completing treatment with curative intent*
The wishes and suggestions put forward by participants are shown in **Table 3**. The following three items were the most commonly put forward:

1. Information for and by healthcare providers, in particular the unfamiliarity of healthcare providers with rehabilitation (mentioned seven times)
2. Psychosocial guidance in this phase is deemed important (mentioned seven times), and
3. Other interventions, such as lifestyle advice (24 hour rhythm, sleep advice) and healthy diet and supplements (mentioned seven times)

**Table 3. Wishes and suggestions in relation to cancer rehabilitation after completing treatment with curative intent**

| | **Total** | **Patient** | **Professional** |
|---|---|---|---|
| **Provision of information** | **N=25** | **N=15** | **N=10** |
| Information on treatment/course/recovery/possible obstacles | 9 | 8 | 1 |

| | | | |
|---|---|---|---|
| Overview of all services available | 3 | 1 | 2 |
| More information for and by healthcare providers | 7 | 5 | 2 |
| Information for partners and family members | 1 | 0 | 1 |
| Information on the use of medication | 1 | 1 | 0 |
| Information for occupational therapists and occupational health and safety service | 1 | 0 | 1 |
| Formulate objectives of rehabilitation | 1 | 0 | 1 |
| Use check and screening lists | 2 | 0 | 2 |
| **Cancer Rehabilitation, Organisation** | **27** | **21** | **6** |
| Tailored healthcare | 5 | 2 | 3 |
| • Adjusted to condition/level/possibilities | *5* | *2* | *3* |
| Contact with fellow patients | 5 | 3 | 2 |
| Logistics | 9 | 9 | 0 |
| • Exercise in a group format | *2* | *2* | *0* |
| • Guidance close to home / accessibility / availability | *3* | *3* | *0* |
| • Reimbursement from health insurers | *3* | *3* | *0* |
| • Low threshold, less forms | *1* | *1* | *0* |
| Moment of service provision/format | 8 | 7 | 1 |
| • Providing rehabilitation early, from the start of treatment or even already before treatment by the physician or nurse / direct after OK | *2* | *2* | *0* |
| • Focus on rehabilitation after completing treatment process | *4* | *4* | *0* |
| • Broad setup, not only Herstel & Balans (a group rehabilitation programme) | *2* | *1* | *1* |
| **Cancer rehabilitation, guidance** | **34** | **26** | **8** |
| Healthcare providers/Content of Cancer Rehabilitation | 13 | 11 | 2 |
| • Physiotherapy | *1* | *1* | *0* |
| • Specialised treatment setting with dietician, ergotherapist, psychologist, physical training and psychosocial training | *1* | *1* | *0* |
| • Psychosocial guidance | *7* | *5* | *2* |
| • Dietary advice/dietician | *4* | *4* | *0* |
| Guidance in tasks/role/points of attention | 21 | 15 | 6 |
| • Own coach | *3* | *2* | *1* |
| • Help with solving problems and clinical problems | *1* | *1* | *0* |
| • Providing physical/emotional support | *6* | *4* | *2* |
| • Guidance on exercise | *5* | *4* | *1* |
| | *1* | *1* | *0* |

| | | | |
|---|---|---|---|
| • Involving the patient's environment | | | |
| • Attention for work, consultation with occupational physician on what is required for work | *2* | *1* | *1* |
| • Attention for reintegration | *3* | *2* | *1* |
| **Physical Training / Rehabilitation** | **7** | **6** | **1** |
| Fitness training/maintaining fitness | 7 | 6 | 1 |
| **Interventions - other** | **16** | **12** | **4** |
| Massage | 1 | 0 | 1 |
| Lifestyle advice, 24 hour rhythm, sleep advice, guidance of environment | 3 | 3 | 0 |
| Healthy diet and supplements | 4 | 4 | 0 |
| Relaxation therapy | 1 | 0 | 1 |
| Attention for late effects | 2 | 2 | 0 |
| Cognitive therapy | 1 | 1 | 0 |
| Fatigue | 2 | 2 | 0 |
| Sexual experience | 1 | 0 | 1 |
| Mind-health therapy | 1 | 0 | 1 |
| **Research** | **3** | **1** | **2** |
| Measure effects of rehabilitation / scientific support needed | 2 | 1 | 1 |
| Inventory of needs and possibilities for cancer rehabilitation | 1 | 0 | 1 |
| **Other** | **5** | **4** | **1** |
| Check after 1.5 years | 1 | 1 | 0 |
| Good breast check-up by blind women | 1 | 1 | 0 |
| Guideline implementation | 1 | 1 | 0 |
| Evaluation of Herstel en Balans (a group rehabilitation programme), providing a clear overview | 1 | 1 | 0 |
| More guidance on cancer nursing after chemotherapy | 1 | 0 | 1 |

Patients indicated they had difficulty with the question in which they were asked to indicate additional clinical problems experienced by professionals after completing cancer treatment with curative intent. No additional clinical problems were provided.

*Rehabilitation in the palliative phase*
*The wishes and suggestions put forward by participants are shown in **Table 4**. The following three items were the most commonly put forward:*

1. A cancer rehabilitation programme should mainly be tailored in this phase, adjusted to the right level, possibilities but especially wishes of the individual, in this phase there is nothing you must do (mentioned sixteen times)
2. Availability of a coach for easily accessible advice/help who knows what is available in support (mentioned eight times), and
3. Psychosocial guidance of family members (mentioned six times

**Table 4. Wishes and suggestions in relation to cancer rehabilitation in the palliative phase**

| | **Total** | **Patient** | **Professional** |
|---|---|---|---|
| **Information** | **N=9** | **N=4** | **N=5** |
| Information about patient organisations/other institutions | 1 | 0 | 1 |
| Information on treatment/course/recovery/possible obstacles | 4 | 3 | 1 |
| Information about the importance of exercise | 1 | 0 | 1 |

| | | | |
|---|---|---|---|
| Practical tips for exercise/doing sports at home, moving even though you do not feel well, once per day | 2 | 0 | 2 |
| Information about fatigue | 1 | 1 | 0 |
| **Cancer rehabilitation, organisation** | **34** | **26** | **8** |
| Tailored healthcare | 17 | 13 | 4 |
| • Tailored, adjusted to condition/level/possibilities and wishes of the patient, there is nothing you must do | *16* | *12* | *4* |
| • Correct referral | *1* | *1* | *0* |
| Contact with fellow patients | 5 | 5 | 0 |
| Logistics | 10 | 7 | 3 |
| • Centering help, various experts together, alignment | *3* | *2* | *1* |
| • Exercise in group format | *4* | *3* | *1* |
| • Guidance close to home / accessibility / availability | *2* | *1* | *1* |
| • Affordability/financing | *1* | *1* | *0* |
| Moment of service provision/format | 2 | 1 | 1 |
| • Broad setup, not only Herstel & Balans (a rehabilitation programme) | *2* | *1* | *1* |
| **Cancer rehabilitation, guidance** | **41** | **28** | **13** |
| Healthcare providers/Content of Cancer Rehabilitation | 17 | 13 | 4 |
| • Physiotherapy | *1* | *1* | *0* |
| • Specialised treatment setting with dietician, ergotherapist, psychologist, physical training and psychosocial training | *2* | *2* | *0* |
| • Psychosocial guidance | *12* | *9* | *3* |
| • Dietary advice/dietician | *2* | *1* | *1* |
| Guidance in tasks/role/points of attention | 24 | 15 | 9 |
| • Being available for questions, personal coach | *8* | *6* | *2* |
| • Helping to prioritise | *3* | *1* | *2* |
| • Providing physical/emotional support | *3* | *1* | *2* |
| • Guidance with exercise | *1* | *1* | *0* |
| • Involving the environment | *4* | *3* | *1* |
| • Attention for work, discuss with occupational physician what is required for work | *2* | *1* | *1* |
| • Attention for the complaints of the patient | *1* | *0* | *1* |
| • Sexuality | *1* | *1* | *0* |

| | | | |
|---|---|---|---|
| • Anxiety/depression | *1* | *1* | *0* |
| **Physical Training / Rehabilitation** | **22** | **15** | **7** |
| Fitness training/maintaining fitness | 14 | 10 | 4 |
| Strength training | 3 | 2 | 1 |
| Sports and games in a group format | 3 | 2 | 1 |
| Maitaining mobility | 2 | 1 | 1 |
| **Interventions - other** | **26** | **18** | **8** |
| Massage | 4 | 3 | 1 |
| Body-focused interventions, including breath awareness technique | 1 | 0 | 1 |
| Lifestyle advice, 24 hour rhythm, sleep advice, guidance of environment | 2 | 1 | 1 |
| Relaxation therapy | 3 | 1 | 2 |
| Pain management | 8 | 7 | 1 |
| Psychosocial guidance of family members | 6 | 5 | 1 |
| Mindfulness | 1 | 0 | 1 |
| Counselling | 1 | 1 | 0 |
| **Research** | **0** | **0** | **0** |
| **Other** | **12** | **6** | **6** |
| Information about obtaining services and help with this | 3 | 2 | 1 |
| Learning to deal with reactions from the environment | 1 | 1 | 0 |
| Interventions aimed at improving quality of life | 5 | 1 | 4 |
| Time is precious, taking this into account | 1 | 0 | 1 |
| Not giving up as healthcare providers until he/she has died | 1 | 1 | 0 |
| Support with the process of saying goodbye | 1 | 1 | 0 |

Patients indicated they had difficulty with the question in which they were asked to indicate additional clinical problems experienced by professionals during the stable palliative phase of cancer. If they had to choose something nonetheless, the most relevant clinical problem for them appeared to be ‘It is not known which form of rehabilitation in the palliative phase is suitable to reduce specific complaints'. In doing so, they indicated that this phase concerned improvement in quality of life, that it required tailored healthcare, that the wishes of the participants must be as high a priority as possible, and it must be possible to deviate from a ‘fixed' programme.

Answers to the final question

The answers to the final question ‘What do we need to take into consideration in development of the guideline' are given below. Comments with a * have been made by a healthcare provider.

- It is important to work on your physical fitness yourself
- Offering rehabilitation as a standard after starting the first chemotherapy course
- Having breast cancer checkups performed by blind women, so that abnormalities can be determined at an earlier stage
- Guidance by a personal coach from the moment of diagnosis*
- The treating physician must have a good idea of what is available in the area in which the patient resides and be able to determine if this is suitable/does not lead to potential damage
- Information in-between courses, what you can do yourself for fatigue, for example, and how the environment can support you
- Tailored healthcare within a cancer centre (centralised)
- Treatment plan directly after diagnosis. Incorporate rehabilitation in the broadest sense in this as a standard (as per cardiac rehabilitation)
- Attention for reintegration, combination of work and illness, how to return to work
- Attention for adequate information *
- Individualisation on the basis of personal needs, scientific research and choices*
- In principle, everything is already present in rehabilitation medicine - multidisciplinary approach, provide tailored healthcare with good consultation. The primary referrer must know what is

available*
- Begin physical training from the first treatment, psychosocial guidance after treatment
- Own coach for support, possibly also via the internet, where you can go with all your questions
- Coach
- Coach and buddy that knows everything, who you can approach
- Guideline implementation, how this will come about
- Each patient must be offered rehabilitation that meets quality standards, in which it needs to be evaluated if it is beneficial*
- Continue with Herstel en Balans (a group rehabilitation programme) after three months. Also evaluate the result with the participant.
- Self-rehabilitation if the patient is fine to do so, though receive assistance to aid recovery
- Herstel en Balans must be fully reimbursed by healthcare insurers
- Attention for factors that are needed to resume a ‘normal' life. An eye for what someone needs to be able to handle a rehabilitation programme

*3. Key questions*
After completing the clinical problem inventory by professionals and interactive work conference with (ex)patients with cancer, ten clinical problems were selected. The below key questions have been formulated for these clinical problems for answering in the guideline:

1. Which complaints occur during and after completing treatment with curative intent?*
2. Which complaints occur during the (disease-focused and symptom-focused) palliative phase?
3. Which form of rehabilitation offered at which moment contributes to better work participation and social functioning for people during and after completing treatment with curative intent and in the (disease-focused and symptom-focused) palliative phase?
4. Which form of rehabilitation can prevent/reduce complaints during treatment with curative intent?
5. Which form of rehabilitation can prevent/reduce complaints after completing treatment with curative intent?
6. Which form of rehabilitation can prevent/reduce complaints during the (disease-focused and symptom-focused) palliative phase?
7. Which instrument is valid and usable in the Netherlands for detection of complaints during and after completing treatment with curative intent and in the (disease-focused and symptom-focused) palliative phase?*
8. What should the intake consist of in order to determine which form of rehabilitation is the most suitable for a specific patient?
9. Which measuring instruments are valid and usable in the Netherlands for the effect evaluation of cancer rehabilitation during and after completing treatment with curative intent and in the (disease-focused and symptom-focused) palliative phase?
10. How can the empowerment of the (ex-)patient be increased so that cancer rehabilitation is possible?
11. Tailored healthcare is the common theme in answering the above key questions.

It was found during the search for relevant literature evidence that two key questions (marked with *) needed further sharpening.

- For key question 1, it was not possible to answer the subquestion ‘Which complaints occur during treatment with curative intent?' in a good manner. The guideline ‘Cancer rehabilitation' is aimed at complaints for which cancer rehabilitation may be a beneficial intervention and complaints that occur with many patients, more or less independent of the type of tumour. The complaints that develop immediately, side effects of treatment and complaints for which cancer rehabilitation may be beneficial are all mixed together during treatment with curative intent.
- It was decided for pragmatic reasons to narrow key question 7 to a valid instrument for detection of cancer-related fatigue given the common occurrence of cancer-related fatigue in cancer patients. This guideline did not conduct literature research in relation to the detection of complaints other than cancer-related fatigue, in those cases recommendations for instruments were based on guidelines and/or consensus of the guideline development group.

These adjusted key questions are shown below:
Question 1: Which complaints occur before and after cancer treatment with curative intent?
Question 7: Which instrument is valid and usable in the Netherlands for screening cancer-related fatigue

during and after completing treatment with curative intent and in the (disease-focused and symptom-focused) palliative phase?

An overview of the key questions and the relevant members of the guideline development group can be seen in Table 1.

**Table 1. Key questions in Guideline on Specialised Medical Rehabilitation in Oncology (version 2.0)**

| No. | CB or EB* | Section | Authors |
|---|---|---|---|
| 1 | EB, revision | Which instrument is both valid and suitable for use in the Netherlands for the identification and discussion of symptoms both during and after completion of treatment with curative intent and during the disease and symptom-oriented palliative phase? | Dr J.P. van den Berg<br>Prof. Dr E. Boven,<br>Ms T. Brouwer<br>Ms E.B.L. van Dorst,<br>Ms Y. Engelen<br>Dr J.E.H.M. Hoekstra-Weebers<br>Dr M.M. Stuiver<br>S.L. Wanders |
| 2 | EB, revision | How should intake prior to coordinated interdisciplinary rehabilitation care be structured in order to determine the most suitable rehabilitation care for each individual patient? | Dr J.P. van den Berg<br>Ms T. Brouwer<br>Dr J.E.H.M. Hoekstra-Weebers<br>Dr M.M. Stuiver |
| 3 | EB, new | What are the characteristics of independent adoption/maintaining of a healthy lifestyle (i.e. physically active, healthy diet, abstinence from smoking, limited alcohol intake, healthy body weight) in patients who have been treated for cancer? | Dr J.P. van den Berg<br>Prof. E. Boven<br>Ms T. Brouwer<br>Ms E.B.L. van Dorst<br>Dr J.E.H.M. Hoekstra-Weebers<br>Dr M.M. Stuiver |
| 4 | EB, revision | How effective are rehabilitation interventions delivered during cancer treatment with curative intent on quality of life, role functioning, physical condition, continuation with medical treatment, and fatigue? | Ms J.M.G. Fijn<br>Dr J.E.H.M. Hoekstra-Weebers<br>Dr M.M. Stuiver<br>S.L. Wanders |
| 5 | EB, new | How effective are support, advice and interventions (nursing and otherwise) which are focused on work during and after completion of treatment of cancer with curative intent on participation in work, quality of life, meaningful daily activities, fatigue, and cognitive functioning? | Dr D.J. Bruinvels<br>Ms E.B.L. van Dorst<br>Ms Y. Engelen<br>Ms J.M.G. Fijn |

* EB=evidence based

| Key question | Authors and association | EB or CB |
|---|---|---|
| What is the best way of organising care around specialised medical rehabilitation and recovery of patients with an oncological condition? | Dr J.P. van den Berg<br>Prof. E. Boven, NIV<br>Ms T. Brouwer, NFK<br>Dr D.J. Bruinvels, NVAB<br>Ms E.B.L. van Dorst, NVOG<br>Ms Y. Engelen, V&VN<br>Ms J.M.G. Fijn, NFK<br>Dr J.E.H.M. Hoekstra-Weebers, NVPO<br>Dr M.M. Stuiver, KNGF | **CB** |

| | | |
|---|---|---|
| | S.L. Wanders, NVRO | |
| Is interdisciplinary specialised medical rehabilitation care and its associated individually-delivered interventions cost-effective in patients with cancer? | Prof. E. Boven, NIV<br>Dr J.P. van den Berg, NRSM<br>Ms T. Brouwer, NFK<br>Dr D.J. Bruinvels, NVAB<br>Ms E.B.L. van Dorst, NVOG<br>Ms Y. Engelen, V&VN<br>Ms J.M.G. Fijn, NFK<br>Dr J.E.H.M. Hoekstra-Weebers, NVPO<br>Dr M.M. Stuiver, KNGF<br>S.L. Wanders, NVRO<br>Methodological support: Julius Centre: Dr A. de Wit and Dr M.J. Mangen | **EB** |

Table 1: An overview of the key questions and relevant members of the working group 2017

*4. Defintions and scope*

Before the literature study, the guideline development group further detailed the scope of the cancer rehabilitation guideline and formulated definitions according to PICO (P: Patient, I: Intervention, C: Comparison, O: Outcome) in order to answer the ten keyl questions.

Patient:

- Adults (> 18 years)
- All oncological disorders
    - Depending on the clinical question, the focus is on during or after completing treatment with curative intent and during the palliative phase.
- During treatment with curative intent: treatment for cancer is defined as the period between the start of treatment and:
    - 1 week after the last radiotherapy treatment or,
    - 3 weeks after the last chemotherapy treatment or,
    - 3 weeks after completing hormonal treatment [47].
- Cancer survivor / After completing the treatment with curative intent: patients who have had cancer and who have a high chance of being cured. Cured is defined as having a normal life expectancy and three important components:
    - The disease is no longer pathologically detectable (complete remission)
    - Minimal or no risk of recurrence or relapse
    - The phase is aimed at recovery of functional health (physical, participation level and psychosocial) [294].

  We focus on two distinct phases [38]:

-
    - The extended phase of survival: this phase begins when the survivor goes into remission or has completed treatment. Psychologically, this stage is a time of watchful waiting and wondering if symptoms may be a sign of recurrence or just part of everyday life. Cancer could return at the same site or in a new location. When treatment is complete, diminished contact with the healthcare team can also cause great anxiety. Physically, it is a period of continued limitation resulting from having had both illness and treatment. During this stage, survivors may be learning to live with (chronic) side effects and accompanying anxieties.
    - The permanent stage is defined as a time when the activity of the disease or likelihood of its return is sufficiently small that the cancer can now be considered permanently arrested. A person in this stage may still face the effects of the disease (e.g. problems with employment, psychological challenges, the fear of recurrence, and development of secondary tumours etc).
- During the palliative phase. The palliative phase starts the moment curation is not or no longer possible [251]. The transition point in the continuum of oncological care is the moment that treatment with curative intent needs to make way for treatment aimed at improving or maintaining quality of

life. The following distinction is made in this guideline:
    - Symptom-focused palliative treatment
    - Disease-focused palliative treatment (e.g. palliative chemotherapy, radiotherapy or surgery)
    - The guideline Cancer Rehabilitation explicitly does not focus on terminal palliative treatment
- Quality of life is referred to as: functioning of persons on a physical, psychological and social level and the subjective evaluation of these areas. Quality of life therefore consists of both relative objective and subjective aspects. Objective aspects relate to whether someone has certain limitations as a result of their health. Subjective aspects say something about the evaluation and value assigned by the person regarding (aspects of) their health. It is therefore not just a matter of someone still being able or not able to climb stairs, for example, but also how he/she feels about this or experiences this [219] [216].

*Intervention:*

- Cancer rehabilitation in the care continuum [91] supports the transition of a cancer patient from a period of active therapies aimed at combating disease to a period of giving shape to your life again and living an optimal life with the effects of the disease and treatment. This means a shift from the paradigm in oncology of the acute medicine model to a wellness model [171]. The care of people with cancer and the position of rehabilitation and supportive care is shown diagrammatically below: see Figure 1 [251].
- Rehabilitation may be utilised during and after curative treatment and in the palliative phase to improve the quality of life of people with cancer.

figuur 1

- The CVZ (Health Care Insurance Board) defines cancer rehabilitation as care focused on the functional, physical, psychological and social problems associated with cancer, including aftercare and rehabilitation. It concerns advice and, where needed, guidance in dealing with the disease (coping), recovery, preventing deterioration and improving the physical condition. Cancer rehabilitation should be focused on all phases in which a cancer patient may find themselves (during or after completing treatment with curative intent and during the palliative phase). According to the CVZ, exercise should form part of cancer rehabilitation [CVZ 2008]. The guideline working group adopted the recommendation by the CVZ to especially focus on one of the components of cancer rehabilitation, physical activity (exercise). The reasons for this were:
    1. The already existing positive experiences with the programme ‘Herstel en Balans', in which physical activity (exercise) is an important component.
    2. The extensive Dutch and international literature available about the positive effects of exercise in the prevention and reduction of long-term effects of exercise in the treatment of cancer.
    3. A pragmatic consideration not to choose all imaginable options for cancer rehabilitation, but to concentrate the guideline on one main area of which the efficacy and feasibility are the most plausible
- The WHO defines rehabilitation as a broad scale of activities aimed at enabling patients with limitations to reach or maintain their optimal physical, sensory, intellectual, psychological and/or social levels. This is in addition to medical care and consists of physiotherapy, psychosocial treatment and ergotherapy [van Weert 2007]. The WHO stimulates use of the International Classification of Functioning, Disability and Health (ICF). The ICF is useful in understanding and measuring health-related outcome measures. The ICF describes how people live with their health condition. The ICF is a classification of health and health-related domains and describes physical functions and structures, activities and participation. Body functions are the physiological functions of the human body. Limitations are problems with Body functions. Activities concern the tasks or actions performed by an individual. Limitations in activity level are problems experienced by the individual in performing activities. Participation is involvement in social life and participation problems are problems experienced by the patient in social life. Functioning is an umbrella concept and consists of all bodily functions, activities and participation. The ICF recognises that functioning is influenced by different factors. These factors concern medical factors, such as the disease and its treatment, personal factors such as age, gender and personality, and external factors, such an

individual physical and social context [van Weert 2007].
- The application of the ICF in cancer patients has been described by Gilchrist et al. [Gilchrist 2009] (see Figure 2).



*Figure 2. Cancer Rehabilitation framework based on the ICF*

Comparison:

- No treatment (standard care, waiting list, stretching exercises etc.) or other forms of cancer rehabilitation.

Outcome:

- Effects of cancer [74]:
- Direct effects, which occur during treatment and persist after treatment has been completed, and
- Late effects, which are not present during treatment and only manifest some time later
- Effects of cancer refers to the most important limitations in bodily functions and structures (physical problems, fatigue) and difficulties with activities and participation (e.g. work, activities of daily living, social role, role within the family, quality of life) [92].
- Cancer rehabilitation must be focused on the prevention or reduction in effects of cancer on the different ICF levels. For clinical question 1 (complaints after completing curative treatment) and 2 (complaints in the palliative phase), the most common effects of cancer are (where possible) described per diagnosis group and treatment (chemotherapy, radiotherapy, hormonal treatment).

Cardiac rehabilitation as model:
While answering the clinical questions it appeared that there is relatively little evidence available in relation to cancer patients. Based on the report by the CVZ [45], the development group decided to focus more on the decision tree recommended in the guideline cardiac rehabilitation [189].

- Is there a disruption of/threat to physical functioning?
- Is there a disruption of/threat to psychological functioning?

- Is there a disruption of/threat to social functioning?
- What is the cardiovascular risk profile?
- Is there risk behaviour?

This model of cardiac rehabilitation has been used to give shape to the intake for cancer rehabilitation as well as the referral to cancer rehabilitation programmes.

*5. Project and development group composition*
Alle werkgroepleden zijn afgevaardigd namens wetenschappelijke verenigingen en hebben daarmee het mandaat voor hun inbreng. Bij de samenstelling van de werkgroep is geprobeerd rekening te houden met landelijke spreiding, inbreng van betrokkenen uit zowel academische als algemene ziekenhuizen/instellingen en vertegenwoordiging van de verschillende verenigingen/ disciplines. De patiëntenvereniging is eveneens vertegenwoordigd en in het geval er literatuuronderzoek is gedaan, is er een methodoloog of literatuuronderzoeker betrokken.

*6. Members of the project and guideline working group and advisors*
Werkgroepleden modules organisatie van zorg en kosteneffectiviteit bij de richtlijn MSR 2017

- Dr. J.P. van den Berg, voorzitter, revalidatiearts, Ciran, Venlo; VRA
- Mw. prof.dr. E. Boven, medisch-oncoloog, VU medisch centrum, Amsterdam; NIV
- Dr. D.J. Bruinvels, klinisch arbeidsdeskundige, IKA, Amsterdam; NVAB
- Mw. dr. E.B.L. van Dorst, gynaecoloog UMC Utrecht; NVOG
- Mw. Y. Engelen, verpleegkundig specialist, Reinier de Graaf Groep, Delft; V&VN
- Mw. dr. J.E.H.M. Hoekstra-Weebers, voorzitter NVPO, Utrecht; NVPO
- Dr. M.M. Stuiver, fysiotherapeut en klinisch epidemioloog, Antoni van Leeuwenhoek, Amsterdam; KNGF
- Drs. S.L. Wanders, radiotherapeut, MAASTRO Clinic, Maastricht; NVRO

Methodologische ondersteuning Juliuscentrum

- Mw. dr. A. de Wit en mw. dr. M.J. Mangen

Werkgroepleden 2017:

- J.P. van den Berg, voorzitter, revalidatiearts, Ciran, Venlo, VRA
- prof.dr. E. Boven, medisch-oncoloog, VU medisch centrum, Amsterdam, NIV
- D.J. Bruinvels, klinisch arbeidsdeskundige, IKA, Amsterdam, NVAB
- dr. E.B.L. van Dorst, gynaecoloog UMC Utrecht, NVOG
- Y. Engelen, verpleegkundig specialist, Reinier de Graaf Groep, Delft, V&VN
- dr. J.E.H.M. Hoekstra-Weeberss, voorzitter NVPO, Utrecht, NVPO
- M.M. Stuiver, fysiotherapeut en klinisch epidemioloog, Antoni van Leeuwenhoek, Amsterdam, KNGF
- S.L. Wanders, radiotherapeut, MAASTRO Clinic, Maastricht, NVRO

Patiëntenvertegenwoordigers 2017

- drs. T. Brouwer, NFK
- Drs. J.M.G. Fijn, NFK

Methodologische ondersteuning 2017: Julius centrum; mw. dr. A. de Wit en mw. dr. M.J. Mangen

Procesbegeleiding 2017

- dr. M.J. Velthuis, adviseur IKNL, procesbegeleider
- N.J. Munneke, secretaresse IKNL, secretariële ondersteuning

**Members of the project group 2008**

| Name | Function | Work side | Authorising |
|---|---|---|---|
| Prof. dr. H.F.P. Hillen, voorzitter | Internist, emeritus hoogleraar Interne Geneeskunde | Maastricht Universitair Medisch Centrum | NVMO |
| Drs. M.M. Stuiver | Fysiotherapeut en klinisch epidemioloog | Nederlands Kanker Instituut - Antoni van Leeuwenhoek ziekenhuis, Amsterdam | KNGF |
| Prof. dr. J.W.H. Leer | Radiotherapeut, hoogleraar Radiotherapie | UMCN St. Radboud, Nijmegen | NVRO |
| Prof. dr. R. Sanderman | Psycholoog, hoogleraar Gezondheidspsychologie | Universitair Medisch Centrum Groningen | NIP |
| Prof. dr. J. Rietman | Revalidatiearts, hoogleraar Revalidatiegeneeskunde en technologie | Universiteit Twente, Enschede | VRA |
| Prof. dr. J.A. Roukema | Chirurg, hoogleraar Kwaliteit van leven | Universiteit Tilburg | - |
| Prof. dr. J.W.R. Nortier | Internist, hoogleraar Medische Oncologie | Leids Universitair Medisch Centrum, Leiden | NVMO |
| Mw. dr. N. de Jong *(until March 2010)* | Verpleegkundige | Verzorging en verpleging, Universiteit Maastricht | V&VN Oncologie |
| Mw. drs. C.A.M. van der Heijden *(vanaf March 2010)* | Bestuurslid V&VN oncologie | Jeroen Bosch Ziekenhuis, ‘s Hertogenbosch | V&VN Oncologie |
| Mw. dr. M.A. van der Pol | Procesbegeleider | Integraal Kankercentrum Nederland, locatie Rotterdam | |
| Mw. dr. M.J. Velthuis | Procesbegeleider | Integraal Kankercentrum Nederland, locatie Utrecht | |
| Mw. S. Janssen-van Dijk | Secretaresse | Integraal Kankercentrum Nederland, locatie Rotterdam | |

**Members of the working group**

| Name | Function | Work side | Authorising | Key question |
|---|---|---|---|---|
| Prof. dr. H.F.P. Hillen, voorzitter* | Internist, emeritus hoogleraar Interne Geneeskunde | Maastricht Universitair Medisch Centrum+ | NVMO | 1 |
| Mw. Y. Engelen | Nurse practitioner | Reinier de Graaf Gasthuis, Delft | V&VN Oncologie | 1 |
| Dr. G. Vreugdenhil (*tot augustus 2009)* | Internist-oncoloog | Maxima Medisch Centrum, Veldhoven | NVMO | 1 |
| Mw. dr. M.H.J. van den Beuken *(tot januari 2010)* | Internist, arts palliatieve zorg | Academisch ziekenhuis Maastricht | NVMO | 2 (en 1) |
| Mw. dr. S.C.C.M. Teunissen | Verpleegkundig specialist palliatieve zorg | Universitair Medisch Centrum Utrecht | V&VN Oncologie | 2, 6 |
| Drs. T. Rejda | Bedrijfsgeneeskundige | Academisch Medisch Centrum Amsterdam | NVAB | 3 |
| Mw. A.J. Frans | Ergotherapeut | Academisch Medisch Centrum Amsterdam | Ergotherapie NL | 3 |
| Mw. S. Landman *(until February* | Ergotherapeut | Academisch Medisch Centrum Amsterdam | Ergotherapie NL | 3 |

| | | | | |
|---|---|---|---|---|
| *2009)* | | | | |
| Drs. M.M. Stuiver | Fysiotherapeut en klinisch epidemioloog | Nederlands Kanker Instituut - Antoni van Leeuwenhoek ziekenhuis, Amsterdam | KNGF | 4 |
| Drs. M. van der Werve | Sportarts | Rijnland ziekenhuis, Leiden | VSG | 4 |
| Drs. F.M. Hoogwegt | Psycholoog | Maxima Medisch Centrum, Veldhoven | NIP | 5 |
| Dr. J.P. van den Berg* | Revalidatiearts | Meander Medisch Centrum, Amersfoort | VRA | 5 |
| Mw. prof. dr. E. Lindeman | Revalidatiearts | Universitair Medisch Centrum en Revalidatiecentrum De Hoogstraat Utrecht | VRA | 6 |
| Drs. S.L. Wanders (until May *2009)* | Radiotherapeut-oncoloog | Maastro clinic, Maastricht | - | 7 |
| Dr. R.J. Uitterhoeve | Verpleegkundig specialist | UMC St Radboud, Nijmegen | V&VN Oncologie | 7 (en 1) |
| Drs. L. J. Slot | Psycholoog | Het Roessingh, Enschede | - | 8 |
| Dr. G. Schep | Sportarts | Maxima Medisch Centrum, Veldhoven | VSG | 8 |
| Mw. dr. H.M. Wittink* | Fysiotherapeut en epidemioloog | Hogeschool Utrecht | KNGF | 9 |
| Mw. prof. dr. A.V. Ranchor | Psycholoog | Universitair Medisch Centrum Groningen | NVPO | 9 |
| Prof. dr. H.W. van den Borne | Psycholoog | Universiteit van Maastricht | - | 10 |
| Prof. dr. J.F.A. Pruyn | Psycholoog | Instituut voor Gezondheids en Omgevingsvraagstukken, Schijf | - | 10 |
| Mw. drs. T. Brouwer | Lid Lymfeklierkanker Vereniging Nederland | | NFK | |
| Mw. drs. J.M.G. Fijn | Lid Borstkanker Vereniging Nederland | | NFK | |
| Mw. dr. M.A. van der Pol* | Procesbegeleider | Integraal Kankercentrum Nederland, locatie Rotterdam | | |
| Mw. dr. M.J. Velthuis* | Procesbegeleider | Integraal Kankercentrum Nederland, locatie Utrecht | | |
| Mw. S. Janssen-van Dijk* | Secretaresse | Integraal Kankercentrum Nederland, locatie Rotterdam | | |
| Dr. P.N. Post & Mw. drs. C.J.G.M. Rosenbrand | Senior adviseurs | Kwaliteitsinstituut voor de Gezondheidszorg CBO, Utrecht | | |
| Mw. drs. M.J.R. Poth | Informatiespecialist | Kwaliteitsinstituut voor de Gezondheidszorg CBO, Utrecht | | |
| Mw. dr. G.A. de Wit & Mw. dr. M.J.J. Mangen *(untill June 2009)* | Universitaire hoofddocenten Medical Technology Assessment group | Julius Center Health Sciences and Primary Care, Utrecht | | Economische overwegingen |

***** These guideline working group members participated in the editorial board and adjusted the guideline text where necessary in the guideline development process.

**Advisors**

| Name | Function | Work side |
|---|---|---|
| Mw. drs. A.G. Koppejan-Rensenbrink, eindverantwoordelijke richtlijntraject *(tot januari 2011)* | Leider IKNL-programma Herstel na Kanker Directeur Integraal Kankercentrum Midden Nederland | Integraal Kankercentrum Nederland, locatie Utrecht |
| Mw. drs. B.C.M. Gijsen | Landelijk coördinator IKNL-programma Herstel na Kanker | Integraal Kankercentrum Nederland, locatie Maastricht |

*7. Conflict of interest guideline working group members*
All guideline working group members were asked to fill in a conflict of interest declaration, in which they stated ties with the medical industry at the start and completing the guideline process. An overview of these conflict of interest declarations can be found below. The remaining guideline working group members have declared that at this moment or in the last three years they have not performed any activities on invitation or with subsidy/sponsoring by the medical industry.

*8. Associations/institutions involved*
Initiatief medische revalidatie bij oncologie 2008 en 2017
Nederlandse Vereniging van Revalidatieartsen (VRA)

Autoriserende verenigingen 2008 en 2017
Koninklijk Nederlands Genootschap voor Fysiotherapie (KNGF)
Nederlandse Vereniging voor Arbeids- en Bedrijfsgeneeskunde (NVAB)
Nederlandse Internisten Vereniging (NIV)
Nederlandse Vereniging voor Obstetrie en Gynaecologie (NVGO)
Nederlandse Vereniging voor Psychosociale Oncologie (NVPO)
Nederlandse Vereniging voor Radiotherapie en Oncologie (NVRO)
Verpleegkundigen en Verzorgenden Nederland Oncologie (V&VN Oncologie)

De volgende vereniging stemt in met de inhoud 2008 en 2017
Nederlandse Federatie van Kankerpatiënten (NFK)

Naast de bijdrage van de SKMS (VRA) is de ontwikkeling van deze richtlijn mogelijk gemaakt door financiële bijdragen van A-Care en IKNL (Integraal Kankercentrum Nederland). Na goedkeuring van het verzoek ging een multidisciplinaire richtlijnwerkgroep hiermee van start. IKNL zorgde voor de procesbegeleiding, in samenwerking met META voor methodologische begeleiding en secretariële ondersteuning van het proces.

Betrokken verenigingen 2008 en 2017
Ergotherapie Nederland (EN)
Nederlands Instituut voor Psychologen (NIP)
Nederlandse Vereniging voor Heelkunde (NVvH)
Vereniging voor Sportgeneeskunde (VSG)

*10. Testing the guideline (recommendations) with (ex)patients with cancer*
Introduction
The patient perspective was taken into consideration by two NFK representatives during the entire guideline development process. In order to test the guideline in a broader group and for any potential additions to the guideline from the patient perspective, a small group of (ex)patients with cancer was consulted. A focus group meeting was organised on April 28 2010 for (ex)patients with cancer who had completed or were still receiving treatment with curative intent. During this meeting the (ex)patients exchanged thoughts about their personal experiences during and after completing treatment with cancer rehabilitation. Below is a report of this meeting (A). It was not possible to get a small group together for a focus group discussion consisting of cancer patients in the palliative phase. The questions that were intended for the focus group discussion have been asked by means of a questionnaire. Below is an outline

of the results (B). Both groups of (ex)patients were subsequently asked to comment on the concept recommendations in the guideline. This could be done at home by completing the questionnaire that was either given to take home or sent out. The response to the concept recommendations can be found below (C). The input from these (ex)patients has been included in the definitive version of the concept guideline text.

A. Report for the focus group meeting (ex)patients with cancer during/after completing cancer treatment with curative intent

Participants
The participants in the focus group were approached via various channels:

- In the Utrecht region of the CCCN (Comprehensive Cancer Centre the Netherlands) via internist-oncologist, radiotherapist and physiotherapist (all involved in cancer rehabilitation)
- From the PACT study in the Utrecht region of the CCCN

(Ex)patients were eligible to participate if they had completed or were receiving treatment with curative intent. Experience with cancer rehabilitation was not required, but it was expected that participants were able to contribute their thoughts about this theme.
One NFK representative, also member of the guideline development group, participated in the meeting as an (ex)patient. A total of six (ex)cancer patients participated in the focus group meeting. Characteristics of the (ex)patients are shown in **Table 1**. One participant was in the palliative phase at the time, this person has been asked to recall the situation before this phase.

**Table 1. Characteristics of (ex)patients participating in the focus group meeting (n=6)**

| | |
|---|---|
| Women: number (%) | 4 (67%) |
| Cancer diagnosis: number (%)<br>mamma<br>colon<br>non-Hodgkin<br>Hodgkin<br>ovarian | <br>2 (33%)<br>1 (17%)<br>1 (17%)<br>1 (17%)<br>1 (17%) |
| Number of years since diagnosis<br>0-2 years<br>2-5 years<br>> 5 years | <br>3 (50%)<br>2 (33%)<br>1 (17%) |
| Currently still receiving treatment: number (%) | 0 (0%) |
| Type of treatment<br>Curative<br>Palliative<br><br>Type of treatment<br>Surgery<br>Radiotherapy<br>Chemotherapy<br>Hormone therapy | <br>6 (100%)<br>0 (0%)<br><br>4 (67%)<br>2 (33%)<br>6 (100%)<br>1 (17%) |
| Experience with rehabilitation: number (%) | 3 (50%) |

Method
The chair and discussion leader, Prof. Dr. J.F.A. Pruyn (member of the guideline working group), welcomes everyone and provides a short explanation about the situation with regard to the cancer rehabilitation guideline. This is followed by a description of the three discussion rounds that will take place:
1. Personal introduction
2. Personal experiences during treatment, and
3. Personal experiences after completing treatment

Everyone is able to share their experiences on the basis of questions and a discussion can take place. At the end, the experiences are prioritised. Concept recommendations from the guideline are given to participants to take home and they are asked to respond to these in writing.

Results

I. Experiences during treatment

*What complaints did you experience during treatment*

After creating an inventory of complaints, these were subsequently prioritised. Each participant was able to select a maximum of 5 complaints. The most important complaint received 5 points, the next 4, 3, 2 and 1. Complaints that did not receive any points were given a 0. Per complaint, the points assigned by the six participants were summed up and divided by 6. **Table 2** contains an overview of the prioritised complaints.

**Table 2. Prioritised complaints during treatment with curative intent**

| Complaints | Prioritisation |
|---|---|
| Severe fatigue | 3.33 |
| Nausea | 2.00 |
| Cold hands/feet | 1.33 |
| Hair loss | 1.33 |
| Not working/studying | 1.33 |
| Painful calf muscles | 0.83 |
| Changes in taste | 0.83 |
| Joint pain | 0.66 |
| Constipation | 0.66 |
| Diarrhoea | 0.66 |
| Nail breakage | 0.50 |
| Problems concentrating | 0.50 |
| Balance disorders | 0.33 |
| Short-temperedness | 0.16 |
| Skin damaged/dry | 0.16 |
| Reduced household activities/maintenance | 0.16 |
| Forgetfulness | 0 |
| Fatigue/pain in legs when cycling | 0 |
| Reduced fitness/movement | 0 |

*Did you undertake activities during treatment to do something about these complaints?*

- Walking after chemotherapy, twice per day for half an hour to combat fatigue: getting out there, fresh air, enjoying the outdoors
- 45 min sports per day
- Training during chemotherapy
- Cycling
- Continue jogging (3 times per week)
- Nothing at all
- Very little (did not feel like it), did do a lot of sport previously

*What are the most important reasons you chose for this?*
*Was active:*

- On advice from physiotherapist, 45 minutes per day moderately intensive exercise
- You determine it yourself
- Otherwise I will feel physically weak, go through the treatment phase as best as possible
- Was approached for the PACT study, was already looking at exercise possibilities
- Return as fast as possible to the old level/feeling good
- New insight, rest is not good
- Direct after chemotherapy, not wait until you feel nauseous (distraction)
- I can do something

*Not active:*

- Psychologically not in a good state
- First get better, then go on to other things, too much on my plate now to be able to be active
- Doesn't help anyway, angry

- Betraying your own body

*Which aspects of this activity have you valued the most/would you value?*
Each (ex)patient with cancer was able to indicate what positive aspects he/she has experienced in relation to the activity performed. If no activity was performed, the participant was asked to speculate which aspect they would value about an activity. After an inventory of the positive aspects of an activity was created, these were subsequently prioritised. Each participant was able to select a maximum of 5 aspects. The most important received 5 points, the next 4, 3, 2 and 1. Positive aspects that did not receive any points were given a 0. Per aspect, the points assigned by the six participants were summed up and divided by 6. **Table 3** contains an overview of the prioritised positive aspects.\

**Table 3. Prioritised positive aspects of an activity during treatment with curative intent**

| Positive aspects | Prioritisation |
|---|---|
| Fellow patients (nice, sometimes closed off, no need for this contact, the stories take a bit of getting used to) | 1.50 |
| Confidence, strong enough to get through it | 1.50 |
| Be able to perform/confidence | 1.16 |
| Registering fitness | 1.16 |
| Have a good think while walking | 0.83 |
| Mentally better | 0.83 |
| Relaxation | 0.66 |
| Sports makes you feel good/addiction | 0.66 |
| Big stick guidance | 0.66 |
| It is good to see people get to one's feet, role model | 0.66 |
| Distraction | 0 |
| Means to fill up the day | 0 |
| Show others | 0 |

The above table shows that being active between and with fellow patients was a positive experience. At the same time however, (ex)patients with cancer indicated it was sometimes too much, that they needed to get used to other people's stories.

*What aspects would hold you back from doing an activity/make it difficult to keep up?*
Each (ex)patient with cancer was able to indicate what negative aspects he/she has experienced in relation to the activity performed. If no activity was performed, the participant was asked to speculate which aspect would hold them back from performing an activity. After an inventory of the negative aspects of an activity was created, these were subsequently prioritised. Each participant was able to select a maximum of 5 aspects. The most important received 5 points, the next 4, 3, 2 and 1. Negative aspects that did not receive any points were given a 0. Per aspect, the points assigned by the six participants were summed up and divided by 6. **Table 4** contains an overview of the prioritised negative aspects.

**Table 4. Prioritised negative aspects of an activity during treatment with curative intent**

| Negative aspects | Prioritisation |
|---|---|
| Too tired as chemo's progress | 4.16 |
| Physical problems | 2.00 |
| Conflicts with other activities | 1.66 |
| Travel distance | 1.50 |
| Advice/response by environment (fatigue, ill body) | 1.33 |
| Psychologically crippled | 0.83 |
| Unfamiliar (with rehabilitation programmes) | 0.83 |
| No interest | 0.66 |
| Socially unacceptable (bad for the body) | 0.16 |
| Environment makes you feel scared | 0.16 |

From the above table it appears that being active during chemotherapy treatment was sometimes hard, fatigue became a limiting factor as the chemotherapy courses progressed.

II. Experiences after completing treatment

*What complaints did you experience after completing treatment?*

After creating an inventory of complaints, these were subsequently prioritised. Each participant was able to select a maximum of 5 complaints. The most important complaints received 5 points, the next 4, 3, 2 and 1. Complaints that did not receive any points were given a 0. Per complaint, the points assigned by the six participants were summed up and divided by 6. **Table 5** contains an overview of the prioritised complaints.

**Table 5. Prioritised complaints after completing treatment with curative intent**

| Complaints | Prioritisation |
|---|---|
| General fatigue/more rapidly tired | 2.66 |
| Doing difficult things, doing 2 things at once | 2.00 |
| Choosing what I do in a day/distribution of energy | 1.50 |
| Not fully back to work | 1.16 |
| Concentration problems | 1.00 |
| Pulmonary embolism | 0.83 |
| 2nd tumour | 0.83 |
| Mental fatigue | 0.83 |
| Social activities | 0.66 |
| Cold feet | 0.50 |
| Pain in calf muscles | 0.50 |
| Hardened arteries (volleyball blue arms, difficulty with blood samples) | 0.50 |
| Hospital check-ups/no rhythm | 0.33 |
| Painting/odd jobs | 0.33 |
| Limitations in movement, reaching etc. | 0.16 |
| Forgetfulness | 0.16 |
| Collapsed lung | 0 |
| All impressions, many | 0 |

*Did you undertake activities after completing treatment to reduce these complaints?*

- Cancer rehabilitation: 3x per week, 12 weeks long, fitness and strength, swimming and aqua jogging, sports and games, intake + test evaluation on completion (fitness progress, measuring strength), 3 weeks to 2 months after starting treatment
- Psychological component, three group meetings
- Resume fitness (old exercise habits)
- Body balance and volleyball
- Relaxation (self-taught)

*What are the most important reasons you chose for this?*

- Now I am better, now I am going to start rehabilitation
- Contact with fellow patients
- Black hole
- An expectation from the environment that you are better, while recovery only starts after treatment
- Building up sport activities

*Which aspects of this activity have you valued the most?*

Each (ex)patient with cancer was able to indicate what positive aspects he/she has experienced in relation to the activity performed. If no activity was performed, the participant was asked to speculate which aspect they would value about an activity. After an inventory of the positive aspects of an activity was created, these were subsequently prioritised. Each participant was able to select a maximum of 5 aspects. The most important received 5 points, the next 4, 3, 2 and 1. Positive aspects that did not receive any points were given a 0. Per aspect, the points assigned by the six participants were summed up and divided by 6. **Table 6** contains an overview of the prioritised positive aspects.

**Table 6. Prioritised positive aspects of an activity after completing treatment with curative intent**

| **Positive aspects** | Prioritisation |
|---|---|
| Increase in physical fitness | 2.83 |
| Improvement in psychological self-confidence and picking up life | 2.50 |
| Tailored programme | 2.33 |
| Stimulation through visualisation of results | 0.83 |
| A step to working | 0.83 |
| Normal exercise behaviour: better physically | 0.83 |
| Normal exercise behaviour: relaxation, pleasant | 0.83 |
| Contact with fellow patients (the environment thinks you are better, recognition) | 0.50 |
| Working on recovery that does not occur by itself | 0.50 |
| Sports and games (lighter contact with fellow patients, not only talking) | 0.33 |

*What aspects would hold you back from doing an activity/make it difficult to keep it up?*
Each (ex)patient with cancer was able to indicate what negative aspects he/she has experienced in relation to the activity performed. If no activity was performed, the participant was asked to speculate which aspect would hold them back from performing an activity. After an inventory of the negative aspects of an activity was created, these were subsequently prioritised. Each participant was able to select a maximum of 5 aspects. The most important received 5 points, the next 4, 3, 2 and 1. Negative aspects that did not receive any points were given a 0. Per aspect, the points assigned by the six participants were summed up and divided by 6. **Table 7** contains an overview of the prioritised negative aspects.

**Table 7. Prioritised negative aspects of an activity after completing treatment with curative intent**

| **Negative aspects** | **Prioritisation** |
|---|---|
| Prefer an individually tailored programme than in a group | 2.33 |
| Normal exercise behaviour not yet at the old level | 1.83 |
| No rhythm yet, not yet living normally, simply too early | 1.33 |
| Too much | 0.83 |
| Problems with normal exercise behaviour | 0.83 |
| Not yet returning to work | 0.66 |
| Psychological guidance in group too superficial | 0.50 |

From the above table it appears that a group programme is sometimes a negative experience; there is more need for an individually tailored programme which can be performed individually.

III. Final round
Below are the comments made by participants at the end of the focus group meeting.

- Exercise also makes you feel better mentally, and means you are better able to deal with being unwell
- Why are patients with cancer seen as less important compared to cardiac rehabilitation? (you have to ask for rehabilitation yourself, it is not reimbursed as a standard, it should be offered to everyone)

B. Report - questionnaire for palliative patients

Participants
The participants in the questionnaire were approached via various channels:

- In the region of the Comprehensive Cancer Centre South via healthcare providers
- Via NFK representatives in the guideline development group

A total of seven patients with cancer in the palliative phase completed the questionnaire. The characteristics of these patients are shown in **Table 8**.

**Table 8. Characteristics of palliative cancer patients participating in the questionnaire (n=7)**

| | |
|---|---|
| Women: number (%)* | 4 (57%) |
| Cancer diagnosis: number (%) | |
| mamma | 3 (43%) |
| colon | 1 (14%) |
| non-Hodgkin | 1 (14%) |
| prostate | 1 (14%) |
| ovarian (as a result of BCRA1 mutation) | 1 (14%) |
| metastases present | 4 (57%) |
| Number of years since diagnosis* | |
| 0-2 years | 1 (14%) |
| 2-5 years | 0 (0%) |
| > 5 years | 5 (71%) |
| Currently still in palliative treatment: number (%) | 4 (57%) |
| Previous/current treatment type | |
| Surgery | 5 (71%) |
| Radiotherapy | 5 (71%) |
| Chemotherapy | 3 (43 %) |
| Hormone therapy | 2 (29%) |
| Targeted therapy | 3 (43%) |
| Experience with rehabilitation: number (%) | 1 (14%) |

* The gender and date of primary diagnosis is unknown for one participant, because the relevant person did not fill these details in on the questionnaire.

Method
All participants were asked via a questionnaire, the separate responses are given below.

Results
*What complaints do you experience now, during the palliative phase? What things that you normally do can you no longer do now in the palliative phase?*

1. *I do not experience physical complaints. Only the uncertainty in relation to lymph nodes that are there, but that should actually not be there. I only encounter obstacles in the area of insurance.*
2. *Side effects of medication (including insomnia, depression, all sorts of physical effects). I can still do all the normal things, but with less energy.*
3. *I often get tired quicker, also more frequent headaches or stomach aches. More susceptible to disease. I recently had an abscess in my abdomen, 11 days of treatment in the hospital. The recovery takes a long time now I am at home. I can no longer walk far due to a poor hip and pelvis. I also often have a lot of muscle and bone pain. Painkillers, therapy and swimming enable me to live with it. Apart from that, I live as normally as possible and I still do a lot. But nothing heavy in the house. I still drive! And I get out a lot, by train, to acquaintances and family and other fun trips and travel. When I've been away, then I am very limited for a few days once I get back due to heavy fatigue. But I find it worth it to still undertake things. The most important complaint: often not feeling very well, because there is pain or illness again, such as bladder infection.*
4. *Uncertainty, many things.*
5. *Left arm requires a stocking with intensive use, otherwise it swells up. Stiffer in the joints. Most important complaints: fatigue increases somewhat after infusion, hot flushes are back.*
6. *I kept having a recovery period of 2 months in the phases between courses, in which fatigue and dizzy spells occurred. Afterwards, I was more or less able to resume my previous pattern of activity. I did have very regular bladder infections and pain on my left side.*
7. *Most important complaints: I'm not working, I lack energy and concentration, lymphoedema.*
8. *My energy has increased again somewhat since stopping chemotherapy. I notice it getting better every day. Heavy household tasks are done by home care due to lymphoedema in my arm and shoulder.*

*Have you undertaken activities (self/organised) in this palliative phase to reduce these complaints? And if so, which activities?*

1. I believe that making the right choices in your life and finding a good balance has extended the time between chemotherapy courses considerably. In the past I would go back for chemotherapy after 4 months. It has now been about 3 years ago.

2. I try and stay in my normal rhythm as much as possible. I have especially begun to exercise more vigorously (fitness, walking); these are activities that I undertake myself. I have medication from my GP to combat insomnia (side effect) in particular. It would only seem beneficial to me to undertake further action if the disease or the side effects become too much of a hindrance.
3. Living as normally as possible provides me with the fulfilment and strength to keep going. I still have a zest for life. I received the medication from the hospital, I'd already been swimming for years.
4. No
5. In principle, I'm now doing all work tasks, I only lift from time to time, I play tennis and like to walk. I have previously participated in the Herstel en Balans rehabilitation programme.
6. Only courses of antibiotics. Aside from that I was capable of looking after myself again. On a psychosocial level as well as a physical and mobility level I am finding myself again.
7. I am receiving home care for household tasks. Walking every day and (small) shopping trips during chemotherapy, however difficult that was. Continuing to move has done me good. My motto was: go outside EVERY day! Continue to look after myself. I got help from neighbours, family and other people. Continue to read and train my mind. Keep up to date every day in relation to work, maintain contacts, and read up via email and keep up to date. Appointments with a psychologist. Appointments with an oncology district nurse. Busy myself as much as possible with the course Transactional Analysis and the group sessions.

*What are the most important reasons you chose for this or in fact chose not to do something? Is your choice motivated by your environment (GP, family, partner)?*

1. -
2. As long as I can influence and keep things ‘under control', it increases my perception of quality of life.
3. My own choice, because I can still do a lot. I hope I will be given the chance to enjoy life and especially my family.
4. No, don't do a lot, little energy.
5. My partner stimulated me to do the rehabilitation programme Herstel en Balans. I did not feel at all like doing it but it has given me a lot.
6. I continue to receive good voluntary care from my partner, friends and (ex)colleagues. Having a lot of knowledge and information about the disease process, it's been easier for me to accept my disease and I did not have a need for an IPSO institution (a psychosocial oncology institution). Also no need at all for patient groups or contact with fellow patients. I keep wanting to get out of the medical and/or support circuit to avoid feeling the victim.
7. There is a lot of information and help available, but not concentrated at one place. I have had to search for a bit. From the options available to me I have subsequently made choices that fit my situation. I have (with a few exceptions) avoided contact with fellow patients, detailed medical information and have focused on a ‘normal' life. I'm not sure how that will be in the future, in other phases. Maybe my needs will be different then. My environment did not push me in a particular direction, that wouldn't work. I did receive support in my choices.

*Which aspects of this activity have you valued the most/would you value the most about such an activity (e.g. close to home, expert guidance, tailored healthcare, contact with fellow patients)?*

1. I chose such things myself. It is also quite a process before you trust your own body again, and the self-healing capability of your body. I would highly value a holistic approach. But then quite a concrete and practical approach, so that it would not be too airy-fairy. It is important in this situation to be able to feel happiness, pleasure, balance, and love. I would highly value guidance that is focused on this.
2. I find the most important thing is: expert guidance, tailored healthcare, contact with fellow patients.
3. Luckily I can still look after myself at the moment and in bad times I receive help from my sister. If it gets worse I would need expert guidance and care close to home. I do not like contact with fellow patients, all those other unpleasant stories, I have no need for that. Important: living as normally as possible.
4. -
5. Recognising the situation with others, the understanding. Important: gaining in physical strength, contact with fellow patients.
6. I can understand this would be beneficial to others, certainly when you know little about cancer and

developing recurrences. Also when the home situation changes substantially in the meantime or support is missed. I did have a psychologist at my bed once in hospital when I was ‘looking death in the eye'. It was a good conversation.
7. Important: I am still missing sports adjusted for metastatic cancer, and the effects/results/contraindication. I still have too little information on this. Things are mostly concentrated on recovery. In addition, it takes effort to find good information on this.

*What aspects would hold you back from doing an activity/make it difficult to keep it up? (group, travel, no guidance)*

1. None
2. No opinion yet
3. Soon, when I am more unwell and in my last phase. Then I know I will feel very sad saying goodbye to loved ones. Important in this: being sad, total helplessness.
4. -
5. Important: when my bones become vulnerable, it would probably be the end of doing sports, fatigue.
6. Yes when you have to put in a lot of effort and are already fatigued, it makes you abandon (new) activities.
7. Important: physical aspects; will my body cooperate with what I want to do? And how to adjust when this is not the case.

Responses to concept recommendations
Participants were asked if they agreed with the concept recommendations and if they felt any important matters were missing. They were presented with the concept recommendation for the following key questions: complaints after completing treatment, complaints in the palliative phase, rehabilitation during treatment, rehabilitation after completing treatment, rehabilitation in the palliative phase and empowerment. Below is a short summary of comments provided.

- Complaints after completing treatment, missing: loss of concentration, persistent (physical) limitations, social problems.
- Complaints in the palliative phase, missing: emotional approach and indicates that time/patient/a good listening ear by the physician/nurse is very important.
- Rehabilitation during treatment, missing: under guidance by a physiotherapist, fitness training and comments that ‘better physical health, is also better mental health'.
- Rehabilitation after completing treatment, missing: under guidance by a physiotherapist.
- Rehabilitation in the palliative phase, missing: advice from the healthcare provider and indicates that patient can also put forward their needs.
- Empowerment, the response is that recommendations are not clearly formulated, the advice is to have participants keep their own records to get a good overview of progress and for motivation purposes, less attention for the age of the patient but more for the condition before treatment and in the current status, positive encouragement can be stimulating, but it should not become forced. Patients should be valued as people, not as patient.

*11. Scientific argumentation*
Each chapter of the guideline is organised according to a fixed structure, as shown below. The aim is transparency of the guideline, so that each user can see on which literature and considerations particular recommendations are based.

Description of the literature
Answers to the clinical questions (and therefore the recommendations in this guideline) are, as much as possible, based on published scientific research. The selected articles were evaluated by the CBO for study quality and graded according to the degree of evidence using the below classification.

*Classification regarding methodological quality of individual studies*

| For articles relating to intervention | |
|---|---|
| A1 | systematic reviews covering at least some A2-level studies, in which the results of the individual studies are consistent. |
| A2 | Randomised comparative clinical studies of good quality, sufficient size and consistency. |
| B | |

| | |
|---|---|
| | Randomised clinical trials of moderate quality or insufficient size, or other comparative studies (non-randomised, comparative cohort study, patient-control study) |
| C | Not-comparative study |
| D | Expert opinion (e.g. the guideline development group members) |

| For articles relating to diagnostics | |
|---|---|
| A1 | Research on the effects of diagnostics on clinical outcomes in a prospectively followed, well-defined patient group with a policy defined beforehand on the basis of test results to be researched, or decision analysis research on the effects of diagnostics on clinical outcomes based on results of a study of A2-level and the mutual dependency of diagnostic tests is taken sufficiently into account |
| A2 | Research in relation to a reference test, in which criteria are defined beforehand for the index and reference test, using a good description of the test and the clinical population researched; it must involve a sufficiently large series of consecutive patients, use upper threshold values for the test that are defined beforehand, and the results of the test and the 'gold standard' are evaluated independently. In situations in which multiple, diagnostic tests play a role, there is (in principle) a mutual dependency and the analysis needs to take this into consideration; for example, using logistic regression |
| B | Comparison with a reference test, an outline of the test and population researched, but not the characteristics mentioned above in category A |
| C | Non-comparative study |
| D | Expert opinion (e.g. the guideline development group members) |

| For articles in relation to harm or side effects, aetiology, prognosis* | |
|---|---|
| A1 | Systematic reviews covering at least some A2-level studies, in which the results of the individual studies are consistent. |
| A2 | Prospective cohort studies of sufficient size and follow-up, in which confounding has been adequately checked and selective follow-up has been sufficiently excluded. |
| B | Prospective cohort study, but not with all the characteristics mentioned in A2 or retrospective cohort study or patient-control study. |
| C | Non-comparative study |
| D | Expert opinion (e.g. the guideline development group members) |

* This classification is only applicable in situations in which controlled trials are not possible for ethical or other reasons. If they are possible, the classification for interventions applies.

For prevalence studies, both prospective and retrospective observational studies have been included on the condition that they are of sufficient quality (good description of the population, definitions, measuring methods and outcomes of the interventions).

Conclusion

The literature has been summarised in a conclusion, in which the level of the most relevant evidence is displayed. To this end, the below classification has been used:

| Level of evidence associated with the conclusions | |
|---|---|
| 1 | 1 systematic review (A1) or at least 2 independently conducted studies of level A1 or A2 |
| 2 | 1 A2-level study or at least 2 independently conducted level-B studies |
| 3 | 1 B- or C-level study |
| 4 | Expert opinion (e.g. the guideline development group members) |

Remaining considerations

Aside from scientific evidence, other aspects such as the patient perspective, organisational aspects and costs are also of importance in arriving at a recommendation. These aspects are discussed under the heading 'remaining considerations'.

Recommendation

The final recommendation is the result of scientific conclusion, in which the remaining considerations are taken into account.

*12. Literature searches*

**Question 1: Which complaints occur during and after completing treatment with curative intent?**

*First search*

A search was performed in Medline on 18 May 2009 at the CBO in the presence of the development group members Y. Engelen and G. Vreugdenhil via de interface OVID. The searches in Embase (via OVID), PsycINFO (via OVID) and CINAHL (via EbscoHost) were performed on 19 May 2009 in the absence of guideline development group members by the information specialist according to the same search strategy.

This PICO was formulated during the search for this question:

**P** Search strategy for patient population that was already present

**I** The customary treatments for cancer (see P)

**C**

**O** All expected complaints:

Fatigue/, exp Pain/, Sick Leave/, Absenteeism/, Motor Skills/, Workload/, "Quality of Life"/ , exp Body Composition/, "Activities of Daily Living"/, Paresthesia/, Lymphedema/, (fatigue or pain).ti,ab., (tired$ or weary or weariness or exhaustion or exhausted or lacklustre or ((astenia or ashtenic) and syndrome) or ((lack or loss or lost) adj3 (energy or vigour))).tw., (loss adj5 strength).tw., ((lack or loss or lost) adj3 physical capacit$).tw., muscle adj6 strength.ti,ab., quality of life.tw., well?being.ti,ab., (physical adj3 fitness).ti,ab., (functional adj3 capacit$).ti,ab., (depression or depressive).ti,ab., ((body adj3 composition) or BMI or (body adj3 fat)).ti,ab. , (body adj3 weight).ti,ab., (exercise adj6 (intoler$ or toler$)).ti,ab., (stress or distress or anxiety).tw., (activity or participation).ti,ab., vitality.ti,ab., fitness.ti,ab., (walk$ or mobility).ti,ab., (breathlessness or short of breath).ti,ab., (functional adj3 independ$).ti,ab., ((neurological adj3 symptom$) or neuropath$ or myelopath$).ti,ab., paresthesi$.ti,ab., lymph?edema.ti,ab., (return to work or return-to-work).ti,ab., (social adj3 (functi$ or perform$ or variab$ or chang$ or status)).ti,ab., (psychological adj3 (functi$ or perform$ or variab$ or chang$ or status)).ti,ab. , (physical$ adj3 (functi$ or perform$ or variab$ or chang$ or status)).ti,ab.

The keywords and free text terms in the O follow from searches for this guideline that have already taken place. Components of the PICO are adjusted during the search.

A deviation is made from this strategy during the discussion of the prepared PICO. It is agreed to search systematic reviews and RCT's for the most common complaints with (the treatment of) cancer (according to that specified and selected by both development group members): fatigue, pain, cognitive dysfunction (concentration, memory), physical dysfunction, depression/anxiety/stress/distress, psychosocial or sexual dysfunctioning (part of quality of life). A search is not made for the different complaints in one search: it is agreed that a search is made now for fatigue, and that the information specialist will search for the other complaints in the absence of development group members.

For the P, the part ‘cancer survivors' is used from the search strategy *med090421 P cancer rehabilitation version 2* saved in Ovid, supplemented with terms for cancer. The relevant search strategy is:

| **P** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | exp Neoplasms/<br>exp Radiotherapy/<br>Bone Marrow Transplantation/ | OR | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti,ab.<br>(radioth$ or radiat$ or irradiat$ or radiochemo$ or chemotherap$).ti,ab.<br>(bone marrow adj5 transplant$).ti,ab. |
| 2 | Survivors/ | OR | ((disease-free or disease free) adj3 surviv$).tw. |
| 3 | | 1 AND 2 | |
| 4 | | | ((cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$) adj3 surviv$).tw. |
| 5 | | 3 OR 4 | |
| 6 | exp Neoplasms/ | OR | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti,ab. |
| 7 | | 5 or 6 | |

For **I** (intervention = types of cancer treatment), part of the search strategy *med090421 P cancer*

*rehabilitation version 2* saved in Ovid is used, supplemented with a few types of treatment. The resulting search strategy is:

| **I** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | exp treatment outcome/ | OR | (curative adj3 (treatment$ or care or caring)).ti,ab. |
| 2 | exp Neoplasms/<br>exp Radiotherapy/<br>Bone Marrow Transplantation/ | OR | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti,ab.<br>(radioth$ or radiat$ or irradiat$ or radiochemo$ or chemotherap$).ti,ab.<br>(bone marrow adj5 transplant$).ti,ab. |
| 3 | | 1 AND 2 | |
| 4 | exp Radiotherapy/<br>Bone Marrow Transplantation/<br>exp Neoplasms/dt, su, th [Drug Therapy, Surgery, Therapy] | OR | ((cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$) adj3 treat$).tw.<br>(radioth$ or radiat$ or irradiat$ or radiochemo$ or chemotherap$).ti,ab.<br>(bone marrow adj5 transplant$).ti,ab. |
| 4 | | 3 OR 4 | |

The search strategy for the **O** outcome (complaints) is as follows:

| **onderdeel** | **O** | **trefwoorden** | **operator** | **woorden in titel (ti) of abstract (ab)** |
|---|---|---|---|---|
| *fatigue* | 1 | Fatigue/ | OR | fatigue.ti,ab. |
| *pain* | 2 | | | ((cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$) adj5 pain).ti,ab. |
| *cognitive dysfunction* | 3 | exp Cognition Disorders/<br>exp Confusion/<br>exp Memory Disorders/<br>Attention/ | OR | (attention or confusion or (cognit$ adj2 (disorder or dysfunction$ or function$ or ability or perform$ or impair$ or defect$)) or (memory adj2 (disorder or dysfunction$ or function$ or ability or perform$ or impair$ or defect$))).ti,ab. |

The following strategy (**S**) is used to limit the number of hits and make it more specific for the topic:

| **onderdeel** | **S** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|---|
| *fatigue* | 1 | | | ((cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$) adj5 fatigue).ti,ab. |
| *pain* | 2 | | | (((cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$) adj5 pain).ti. |
| *cognitive dysfunction* | 3 | | | ((attention or confusion or (cognit$ adj2 (disorder or dysfunction$ or function$ or ability or perform$ or impair$ or defect$)) or (memory adj2 (disorder or dysfunction$ or function$ or ability or perform$ or impair$ or defect$))) adj5 (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$)).ti. |

The search strategy **F search filters for study types** is as follows:

| **onderdeel** | **F** | **trefwoorden** | **operator** | **woorden in alle velden (af), publicatietype (pt) of tekst (tw)** |
|---|---|---|---|---|
| *systematic reviews en meta-analyses (med071129systrev)* | sysrev | | OR | meta analysis.pt.<br>meta-anal*.af.<br>metaanal*.af.<br>(quantitativ* adj10 review*).tw.<br>(quantitativ* adj10 overview*).tw.<br>(systematic* adj10 review*).tw.<br>(systematic* adj10 overview*).tw.<br>(methodologic* adj10 review*).tw.<br>(methodologic* adj10 |

| | | | | |
|---|---|---|---|---|
| | | | | overview*).tw.<br>medline.tw. and review-.pt.<br>(pooled adj3 analy*).tw. |
| *randomised controlled trials (med080617rctCBO)* | rct | randomized controlled trial/ | OR | randomized-controlled-trial.pt.<br>controlled-clinical-trial.pt.<br>randomized controlled trials.tw.<br>random-allocation.af.<br>double-blind-method.af.<br>single-blind-method.af<br>(random adj8 (selection? or sample?)).tw.<br>random*.tw. |
| *observational studies* | obs | epidemiologic-studies/ exp<br>case-control-studies/ exp cohort-studies/<br>cross-sectional-studies/ | OR | case with control.af.<br>(cohort adj5 study).af.<br>(cohort adj5 studies).af.<br>(cohort adj5 analy$).af.<br>(follow-up adj5 (study or studies)).af.<br>(longitudinal or retrospective or (cross adj5 sectional)).af.<br>(observational adj5 (study or studies)).af.<br>prospective.af. |

**Results of this search** (all articles are saved in Reference Manager file 'OncoReval - herhaling vraag 1' with the file name as keyword):

| **database** | **bijgewerkt tot** | **aantal treffers** | **bestandsnaam** |
|---|---|---|---|
| **voor onderdeel Fatigue: combinatie: P AND I AND O1 AND Fsysrev v.a. 2004** | | | |
| Medline | 15052009 | 52 | med090518 fatigue sysrev |
| Embase | week 20 2009 | 65 | emb090519 fatigue sysrev |
| PsycINFO | 11052009 | 24 | psy090519 fatigue sysrev |
| CINAHL | 08052009 | 43 | cin090519 fatigue sysrev |
| **voor onderdeel Fatigue: combinatie P AND I AND O1 AND Frct AND S1** | | | |
| Medline | 15052009 | 138 | med090518 fatigue rct |
| Embase | week 20 2009 | 277 | emb090519 fatigue rct |
| PsycINFO | 11052009 | 19 | psy090519 fatigue rct |
| CINAHL | 08052009 | 204 | cin090519 fatigue rct |
| **voor onderdeel Pain : P AND I AND O2 AND Fsysrev v.a. 2004** | | | |
| Medline | 12062009 | 91 | med090612 pain sysrev |
| Embase | week 24 2009 | 80 | emb090615 pain sysrev |
| PsycINFO | 01062009 | 42 | psy090615 pain sysrev |
| CINAHL | 05062009 | 84 | cin090616 pain sysrev |
| **voor onderdeel Pain : P AND I AND O2 AND Frct AND S2** | | | |
| Medline | 12062009 | 120 | med090612 pain rct |
| Embase | week 24 2009 | 234 | emb090615 pain rct |
| PsycINFO | 01062009 | 27 | psy090615 pain rct |
| CINAHL | 05062009 | 150 | cin090616 pain rct |
| **voor onderdeel Pain : P AND I AND O2 AND Fobs** | | | |
| Medline | 12062009 | 128 | med090612 pain pros |
| Embase | week 24 2009 | 143 | emb090615 pain pros |
| PsycINFO | 01062009 | 0 | |

| | | | |
|---|---|---|---|
| CINAHL | 05062009 | 45 | cin090616 pain pros |
| **voor onderdeel Cognitive dysfunction : P AND I AND O3 AND Fsysrev v.a. 2004** | | | |
| Medline | 12062009 | 86 | med090612 cognitive dysfunction sysrev |
| Embase | week 24 2009 | 5 | emb090615 cognitive dysfunction sysrev |
| PsycINFO | 01062009 | 53 | psy090615 cognitive dysfunction sysrev |
| CINAHL | 05062009 | 33 | cin090616 cognitive dysfunction sysrev |
| **voor onderdeel Cognitive dysfunction : P AND I AND O3 AND Frct AND S3** | | | |
| Medline | 12062009 | 150 | med090612 cognitive dysfunction rct |
| Embase | week 24 2009 | 24 | emb090615 cognitive dysfunction rct |
| PsycINFO | 01062009 | 17 | psy090615 cognitive dysfunction rct |
| CINAHL | 05062009 | 8 | cin090616 cognitive dysfunction rct |
| **voor onderdeel Cognitive dysfunction : P AND I AND O3 AND Fobs** | | | |
| Medline | 12062009 | 85 | med090612 cognitive dysfunction pros |
| Embase | week 24 2009 | 27 | emb090615 cognitive dysfunction pros |
| PsycINFO | 01062009 | 0 | |
| CINAHL | 05062009 | 168 | cin 090616 cognitive dysfunction pros |

Limitations: no articles that are exclusively about animals, only articles in the Dutch and English language, only articles about adults (>18 years of age) and only articles from 1999 through to 2009. Excluding articles about children (<19 years of age) is unreliable in CINAHL; a limit was therefore not put on age in this database.

General comments:

1. The number of references in Reference Manager and therefore also in literature lists deviates from the number of hits, because articles already captured are (where possible) not imported in Reference Manager.
2. The keywords mentioned in this report are MeSH keywords. For other databases, the keywords used are as close as possible to the mentioned keywords in terms of meaning.
3. The search strategies used were saved in the files.

Second search
The information specialist independently searched in the databases Medline and Embase (both via interface OvidSP) on 9 and 13 July 2009 on the basis of the email from the ACCC process manager M.J. Velthuis, dated 1 July 2009, in which 2 PICO's were formulated for this question.

For the P, the following components were used from the search strategy *med090421 P cancer rehabilitation version 2* saved in Ovid, so that *cancer, cancer curative care, cancer palliative care* and *cancer survivors* are included.

| **P** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | exp Neoplasms/ | OR | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti,ab. |
| 2 | | | ((cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$) adj3 surviv$).tw. |
| 3 | Survivors/ | OR | ((disease-free or disease free) adj3 surviv$).tw. |
| 4 | exp Neoplasms/<br>exp Radiotherapy/<br>Bone Marrow Transplantation/ | OR | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti,ab.<br>(radioth$ or radiat$ or irradiat$ or radiochemo$ or chemotherap$).ti,ab.<br>(bone marrow adj5 transplant$).ti,ab. |

| | | | |
|---|---|---|---|
| 5 | | 3 AND 4 | |
| 6 | | | (advanc$ adj2 (cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$)).tw. |
| 7 | palliative care/ or exp terminal care/<br>Terminally Ill/ | OR | (palliative adj (treatment$ or care or caring)).ti,ab. |
| 8 | | 7 AND 4 | |
| 9 | | | ((cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$) adj3 treat$).tw. |
| 10 | exp treatment outcome/ | OR | (curative adj3 (treatment$ or care or caring)).ti,ab. |
| 11 | | 10 AND 4 | |
| | | 1 or 2 or 5 or 6 or 8 or 9 or 11 | |

For **I** (intervention = types of cancer treatment), part of the search strategy *med090421 P cancer rehabilitation version 2* saved in Ovid is used, supplemented with a few types of treatment. The resulting search strategy is:

| **I** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | exp Radiotherapy/<br>Bone Marrow Transplantation/<br>exp Neoplasms/rt, dt, su, th, dh [Radiotherapy, Drug Therapy, Surgery, Therapy, Diet Therapy] | OR | (radioth$ or radiat$ or irradiat$ or radiochemo$ or chemotherap$).ti,ab.<br>(bone marrow adj5 transplant$).ti,ab. |

The search strategy for the **O** outcome (complaints) is as follows:

| **O** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | | OR | (satisfaction adj10 (cancer or treat$ or therap$ or intervent$ or symptom$ or function$ or surg$)).ti.<br>(symptom$ adj7 (assess$ or experienc$ or frequenc$ or prevalenc$ or risk$ or treat$ or outccome or impact or chemotherap$ or cancer or manag$ or level or impair$ or function$)).ti.<br>(symptom$ adj7 (assess$ or experienc$ or frequenc$ or prevalenc$ or risk$ or treat$ or outccome or impact or chemotherap$ or cancer or manag$ or level or impair$ or function$ or burden or distress)).ti.<br>(return to work or return-to-work).ti.<br>(participat$ adj5 (social$ or communit$)).ti.<br>((physical$ or social$ or psychosocial$) adj3 (function$ or dysfunction$ or capac$ or impair$)).ti,ab.<br>((late or adverse or harm$) adj3 effect$ adj7 (chemotherap$ or radiotherap$ or treatment$ or intervention$)).ti.<br>(social adj3 (functi$ or perform$ or variab$ or chang$ or status or role)).ti.<br>((cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$) adj7 fatigue).ti.<br>(daily adj3 activit$).ti. |

Cancer and synonyms are included in the title (**B**) in order to limit the number of hits and make it more specific for the topic:

| **B** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | | | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti. |

The search strategy for the filter for systematic reviews and meta-analyses *med071129systrev* is as follows:

| **F(sysrev)** | **trefwoorden** | **operator** | **woorden in affiliatie (af), publicatietype (pt) of tekst (tw)** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 1 | | OR | meta analysis.pt.<br>meta-anal*.af.<br>metaanal*.af.<br>(quantitativ* adj10 review*).tw.<br>(quantitativ* adj10 overview*).tw.<br>(systematic* adj10 review*).tw.<br>(systematic* adj10 overview*).tw.<br>(methodologic* adj10 review*).tw.<br>(methodologic* adj10 overview*).tw.<br>medline.tw. and review-.pt.<br>(pooled adj3 analy*).tw. |

The search strategy for observational studies *med071128observationalCBO* is as follows:

| F(obs) | trefwoorden | operator | woorden in alle velden (af), publicatietype (pt) of tekst (tw) |
|---|---|---|---|
| 1 | epidemiologic-studies/<br>exp case-control-studies/<br>exp cohort-studies/<br>cross-sectional-studies/ | OR | case with control.af.<br>(cohort adj5 study).af.<br>(cohort adj5 studies).af.<br>(cohort adj5 analy$).af.<br>(follow-up adj5 (study or studies)).af.<br>(longitudinal or retrospective or (cross adj5 sectional)).af.<br>(observational adj5 (study or studies)).af.<br>prospective.af. |

**Results of this search** (all articles are saved in Reference Manager file 'OncoReval - herhaling vraag 1', with the file name as keyword):

| database | bijgewerkt tot | aantal treffers | bestandsnaam |
|---|---|---|---|
| **combinatie: P AND I AND O AND B AND F(sysrev)** | | | |
| Medline | 8 juli 2009 | 65 | med090709 prevalentie sysrev |
| Embase | week 27 2009 | 47 | emb090713 prevalentie sysrev |
| **combinatie PAND I AND O AND B AND F(obs) v.a. 2004** | | | |
| Medline | 8 juli 2009 | 482 | med090709 prevalentie en kanker in ti observationeel va 2004 |
| Embase | week 27 2009 | 297 | emb090713 prevalentie en kanker in ti observationeel va 2004 |

Limitations: no articles that are exclusively about animals, only articles in the Dutch, English and German language, and only articles from 1999 through to 2009 (unless otherwise indicated).

Third search

Based on the exchange of email in October 2009, it was decided to copy a search conducted for the guideline 'cancer rehabilitation' and to supplement it with recent literature. It was agreed to follow the search strategies for question 1 and 2 of that guideline.
A search was performed in Medline and Embase via the interface OvidSP on 27 October 2009.

The search strategy for the **P (patient population)** is:

| P | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | exp *Neoplasms/ | OR | (cancer or tumo?r or neoplasm* or carcino* or maligna*).ti. |

The search strategy for the **O outcome** (outcome measures) is as follows:

| O | trefwoorden | operator | woorden in titel (ti),abstract (ab), tekst (tw) of floating subheading (fs) |
|---|---|---|---|
| 1 | | OR | ((Mental health or Role-emotional or Social functioning) adj8 dimension?).tw.<br>((Mental health or Role-emotional or Social functioning) adj8 (impact* or effect? or aspect?)).tw. |
| 2 | exp Psychometrics/<br>exp *Sickness Impact Profile/ | OR | Sickness Impact Profile.ti,ab.<br>quality of life.ti,ab. |

| | | | | |
|---|---|---|---|---|
| | exp Sickness Impact Profile/<br>exp "Quality of Life"/ | | | (General Health Questionnaire or GHQ or HRQoL).tw. |
| 3 | "Quality-Assurance-Health-Care"/<br>"Delivery-of-Health-Care"/<br>"Outcome-Assessment-Health-Care"/ | | OR | |
| 4 | exp Evidence-Based Practice/ | | | |
| 5 | 1 | exp Fatigue/<br>exp Depression/ | OR | (fatigue or distress or depression or anxiety).ti,ab.<br>px.fs. |
| | 2 | | | (mt or st).fs. |
| | 3 | | 1 AND 2 | |

The search strategy for **F search filters for study types** is as follows:

| **F** | **trefwoorden** | **operator** | **woorden in alle velden (af), publicatietype (pt) of tekst (tw)** |
|---|---|---|---|
| sysrev | | OR | meta analysis.pt.<br>meta-anal*.af.<br>metaanal*.af.<br>(quantitativ* adj10 review*).tw.<br>(quantitativ* adj10 overview*).tw.<br>(systematic* adj10 review*).tw.<br>(systematic* adj10 overview*).tw.<br>(methodologic* adj10 review*).tw.<br>(methodologic* adj10 overview*).tw.<br>medline.tw. and review-.pt.<br>(pooled adj3 analy*).tw. |

**Results of this search** (all articles are saved in Reference Manager file 'OncoReval - update nazorg bij kanker', with the file name as keyword):

| **database** | **bijgewerkt tot** | **aantal treffers** | **bestandsnaam** |
|---|---|---|---|
| **combinatie: (P and O1 and O2) or (P and (O1 or O2) and O3 and Fsysrev)** | | | |
| Medline | 26102009 | 13 | med091027 vraag 1 |
| Embase | week 43 2009 | 74 | emb091027 vraag 1 |
| **combinatie: (P and O2 and O4 and Fsysrev) or (P and (O1 or O2) and O5 and Fsysrev)** | | | |
| Medline | 26102009 | 10 | med091027 vraag 2 |
| Embase | week 43 2009 | 6 | emb091027 vraag 2 |

Limitations: only articles in the Dutch, English, German or French language, and only articles from 2009 through to the point in time the search was conducted.

**Question 2: Which complaints occur during the (disease-focused and symptom-focused) palliative phase?**

A search was performed for this question in Medline, Embase and PsycINFO (all via the interface OvidSP) on 25 May 2009 in the presence of the development group member Saskia Teunissen.

The search strategy for the **P (patient population)** is:

| **P** | **trefwoorden** | **operator** | **woorden in titel (ti) of abstract (ab)** |
|---|---|---|---|
| 1 | | OR | (advanc$ adj2 (cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$)).tw.<br>(palliative adj (treatment$ or care or medicine)).ti,ab. |

The search strategy for the **O outcome** (outcome measures) is as follows:

| **O** | **trefwoorden** | **operator** | **woorden in titel (ti) of abstract (ab)** |
|---|---|---|---|
| 1 | | OR | (symptom$ adj5 burden).ti,ab.<br>(symptom$ adj5 (palliation or management)).ti,ab. |

| | | | |
|---|---|---|---|
| | | | (symptom$ adj5 prevalence).ti,ab.<br>(symptom$ adj5 distress).ti,ab. |
| 2 | exp prognosis/<br>"Quality of Life"/ | OR | ((prevent$ or reduc$ or declin$ or less or protect$ or few$ or alleviat$ or improve$ or manag$) adj5 symptom$).ti,ab.<br>survival.ti,ab.<br>prognosis.ti,ab.<br>quality of life.ti,ab. |

The search strategy for **F search filters for study types** is as follows:

| **F** | **trefwoorden** | **operator** | **woorden in alle velden (af), publicatietype (pt) of tekst (tw)** |
|---|---|---|---|
| sysrev | | OR | meta analysis.pt.<br>meta-anal*.af.<br>metaanal*.af.<br>(quantitativ* adj10 review*).tw.<br>(quantitativ* adj10 overview*).tw.<br>(systematic* adj10 review*).tw.<br>(systematic* adj10 overview*).tw.<br>(methodologic* adj10 review*).tw.<br>(methodologic* adj10 overview*).tw.<br>medline.tw. and review-.pt.<br>(pooled adj3 analy*).tw. |

The following strategy is formulated to make the results **more specific** and limit the number of hits:

| **S** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | | OR | (cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$).ti. |

Results of this search (all articles are saved in Reference Manager file 'Oncologische revalidatie - vraag 2', with the file name as keyword):

| **database** | **bijgewerkt tot** | **aantal treffers** | **bestandsnaam** |
|---|---|---|---|
| **combinatie: P and O1 and O2 and Fsysrev and S** | | | |
| Medline | 22052009 | 12 | med090525 vraag 2 sysrev |
| Embase | week 21 2009 | 12 | emb090525 vraag 2 sysrev |
| PsycINFO | 18052009 | 5 | psy090525 vraag 2 sysrev |
| **combinatie: P and O1 and O2 and S** (zonder eerder gedownloade referenties) | | | |
| Medline | 22052009 | 218 | med090525 vraag 2 alles |
| Embase | week 21 2009 | 168 | emb090525 vraag 2 alles |
| PsycINFO | 18052009 | 37 | psy090525 vraag 2 alles |

Limitations: only articles in the Dutch and English language, only articles on human studies and only those from 1999 through to the point in time the search was conducted.

**Question 3: Which form of rehabilitation offered at which moment contributes to better work participation and social functioning for people during and after completing treatment with curative intent and in the (disease-focused and symptom-focused) palliative phase?**

A search was performed in Medline on 9 April 2009 at the CBO in the presence of the development group member T. Rejda via de interface OVID. T. Rejda sent through another 2 key articles after this search. Neither article had been found in the search. The literature specialist then decided to conduct the search again using the keywords of the original search, in the absence of a development group member. This search was performed in Medline (updated to 04052009) and Embase (updated to week 18 2009) via the interface OVID on 5 May 2009. The search in CINAHL via EbscoHost (updated to 01052009) is performed according to the same search strategy on 7 and 8 May 2009.

This PICO was formulated during the search for this question:

**P** *Search strategy for patient population* that was already present

**I** All types of known interventions (see P) also think of: (effect* OR control* OR evaluation* OR program* or prevent* OR protect* *) AND (work* OR occupation* or job* or employment$)
(program* OR "prevention and control" [sh]) AND (occupational* OR worker*)

**C**

**O** Keywords for resuming work, participation in the workforce, load capacity etc. also think about the filter work and Quality of life terms
All parts were adjusted during the search.

Only the first part ('cancer and cancer treatment') of the search strategy for *med090421 P cancer rehabilitation version 2* saved in Ovid was used for the P. The search strategy for this is:

| P | trefwoorden | operator | woorden in titel (ti) of abstract (ab) |
|---|---|---|---|
| 1 | exp Neoplasms/<br>exp Radiotherapy/<br>Bone Marrow Transplantation/ | OR | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti,ab.<br>(radioth$ or radiat$ or irradiat$ or radiochemo$ or chemotherap$).ti,ab.<br>(bone marrow adj5 transplant$).ti,ab. |

For **I** (intervention = types of rehabilitation), part of the search strategy *med090421 P cancer rehabilitation version 2* saved in Ovid is used, supplemented with rehabilitation for work:

| I | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | exp Rehabilitation/<br>exp Exercise Therapy/<br>exp Psychotherapy/<br>Meditation/<br>exp Social Work/<br>Time Management/ | OR | rehabilitat$.ti,ab.<br>(interval train$ or sport$ or movement therap$).tw.<br>stretch$.tw.<br>(dance adj2 (therap$ or exercis$)).tw.<br>(tai ji or tai chi or tai?ji or tai?chi or walk$ or yoga).tw.<br>(psychosocial adj3 (interven$ or therap$ or train$ or activ$ or exercis$)).tw.<br>((exercise$ or physical$ or resistance or strenght or flexibility or endurance) adj6 (train$ or program$ or interven$ or exercis$)).tw.<br>((resistance or aerobic$ or endurance$) adj3 (exercis$ or train$ or program$ or interven$ or therap$)).tw.<br>(physical$ adj3 (activ$ or therap$ or train$ or exercis$ or interven$ or program$)).tw.<br>psychotherap$.tw.<br>(behavio?r$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(cognitive adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(relax$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>relaxation.ti,ab.<br>(weight adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>exercise.ti,ab.<br>mindfulness.tw.<br>meditation.ti,ab.<br>((person or client) adj3 (intervention or therap$ or treatment or program$)).ti,ab.<br>social work$.ti,ab.<br>(self efficacy or self-efficacy or empower$).ti,ab.<br>(model adj3 human adj3 occupation).tw.<br>canadian occupational performance measurement.tw.<br>(work related adj3 (intervent$ or program$ or train$ or therap$ or exercis$ or activ$)).tw.<br>(time?manag$ or time manag$).tw.<br>((job or work or occupati$) adj3 adapt$).tw.<br>motivat$.ti,ab. |

As a result of the cancer and treatment, cancer patients have developed symptoms that hinder work reintegration. The search strategy for these symptoms (**S**) is as follows:

| S | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | Fatigue/<br>exp Pain/<br>Sick Leave/ | OR | (fatigue or pain).ti,ab.<br>(tired$ or weary or weariness or exhaustion or exhausted or lacklustre or ((astenia or ashtenic) and syndrome) or ((lack or loss or lost) adj3 (energy or |

| | | | |
|---|---|---|---|
| | Absenteeism/<br>Motor Skills/<br>Workload/ | | vigour))).tw.<br>(loss adj5 strength).tw.<br>((lack or loss or lost) adj3 physical capacit$).tw.<br>((job or work or occupati$) adj3 disabilit$).tw.<br>muscle.ti,ab.<br>sick leave.tw.<br>absent$.tw.<br>(load adj3 (work$ or job or employment or occupat$)).tw.<br>((night adj3 (shift$ or work$)) or (shift adj3 work$)).tw. |

The search strategy for the return to work and the conditions to do so (**T**) is as follows

| T | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | exp Work/<br>Motor Skills/ | OR | ((reduc$ or decline$ or less or few$) adj3 symptom$).tw.<br>(re employment or re?employment).tw.<br>(occupation$ adj3 (reintergration or re-integration or re integration)).tw.<br>((resumption or resume) adj3 (work or job or employment or occupat$)).tw.<br>(return adj5 (work or job or employ$or occupat$)).tw. |

The search strategy for the **O** outcome (quality of life etc.) is as follows:

| O | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | "Quality of Life"/<br>job satisfaction/<br>treatment outcome/ | | quality of life.ti,ab.<br>outcome.ti,ab.<br>((job or work or employment or ocupation$) adj3 satisfact$).tw.<br>(participat$ adj5 (social$ or communit$)).tw. |

**Results of this search** (all articles are saved in Reference Manager file 'Oncologische revalidatie - vraag 3', with the file name as keyword):

| database | aantal treffers | bestandsnaam |
|---|---|---|
| **combinatie: P AND I AND S AND T AND O** | | |
| Medline | 53 | med090505 vraag 3 |
| Embase | 119 | emb090505 vraag 3 |
| CINAHL | 10 | cin090508 vraag 3 |
| | | |

Limitations: no articles that are exclusively about animals, only articles in the Dutch, English, German and French language, only articles about adults (>18 years of age) and only articles from 1999 through to 2009.

**Question 4: Which form of rehabilitation can prevent/reduce complaints during treatment with curative intent?**

A search was performed for this question in Medline and Embase (both via the interface OvidSP) on 21 April 2009 in the presence of the development group members M.M. Stuiver and M. van der Werve. A search was made in CINAHL (via the interface Ebscohost) on 14 May according to the same search strategy by the information specialist in the absence of development group members.

The 'cancer and cancer treatment' part of the saved search strategy *med090421 P cancer rehabilitation version 2* was used for the **P (patient population)**. This search strategy is as follows:

| P | trefwoorden | operator | woorden in titel (ti) of abstract (ab) |
|---|---|---|---|
| 1 | exp Neoplasms/<br>exp Radiotherapy/<br>Bone Marrow Transplantation/ | OR | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti,ab.<br>(radioth$ or radiat$ or irradiat$ or radiochemo$ or chemotherap$).ti,ab.<br>(bone marrow adj5 transplant$).ti,ab. |

The search strategy for the **C curative phase** is as follows:

| C | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | exp treatment outcome/ | OR | (curative adj3 (treatment$ or care or caring)).ti,ab. |
| 2 | | 1 AND P | |
| 3 | | | ((cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ |

| | | | |
|---|---|---|---|
| | | | or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$) adj3 treat$).tw. |
| 4 | | 2 OR 3 | |

The search strategy for the **I intervention** (rehabilitation here, part 'types of rehabilitation' of the saved search strategy *med090421 P cancer rehabilitation version 2* is as follows.

| **I** | **trefwoorden** | | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|---|
| 1 | exp Rehabilitation/<br>exp Exercise Therapy/<br>exp Psychotherapy/<br>Meditation/ | | OR | rehabilitat$.ti,ab.<br>(interval train$ or sport$ or movement therap$).tw.<br>stretch$.tw.<br>(dance adj2 (therap$ or exercis$)).tw.<br>(tai ji or tai chi or tai?ji or tai?chi or walk$ or yoga).tw.<br>(psychosocial adj3 (interven$ or therap$ or train$ or activ$ or exercis$)).tw.<br>((exercise$ or physical$ or resistance or strenght or flexibility or endurance) adj6 (train$ or program$ or interven$ or exercis$)).tw.<br>((resistance or aerobic$ or endurance$) adj3 (exercis$ or train$ or program$ or interven$ or therap$)).tw.<br>(physical$ adj3 (activ$ or therap$ or train$ or exercis$ or interven$ or program$)).tw.<br>psychotherap$.tw.<br>(behavio?r$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(cognitive adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(relax$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>relaxation.ti,ab.<br>(weight adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>exercise.ti,ab.<br>mindfulness.tw.<br>meditation.ti,ab.<br>((person or client) adj3 (intervention or therap$ or treatment or program$)).ti,ab. |
| 2 | 1 | exp Exercise Therapy/ | OR | (interval train$ or sport$ or movement therap$).tw.<br>stretch$.tw.<br>(dance adj2 (therap$ or exercis$)).tw.<br>(tai ji or tai chi or tai?ji or tai?chi or walk$ or yoga).tw.'<br>((exercise$ or physical$ or resistance or strenght or flexibility or endurance) adj6 (train$ or program$ or interven$ or exercis$)).tw.<br>((resistance or aerobic$ or endurance$) adj3 (exercis$ or train$ or program$ or interven$ or therap$)).tw.<br>(physical$ adj3 (activ$ or therap$ or train$ or exercis$ or interven$ or program$)).tw.<br>(weight adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>exercise.ti,ab. |
| | 2 | | OR | (psychological adj3 (functi$ or perform$ or variab$ or chang$ or status)).ti,ab.<br>(depression or depressive).ti,ab. |
| | 3 | | 1 AND 2 | |
| | 4 | "Quality of Life"/<br>exp Body Composition/ | OR | quality of life.tw.<br>well?being.ti,ab.<br>((physical or fitness) adj3 (functi$ or perform$ or variab$ or chang$ or status)).ti,ab.<br>(physical adj3 fitness).ti,ab. |

| | | | | |
|---|---|---|---|---|
| | | | | (functional adj3 capacit$).ti,ab.<br>fatigue.ti,ab.<br>(depression or depressive).ti,ab.<br>((body adj3 composition) or BMI or (body adj3 fat)).ti,ab.<br>(body adj3 weight).ti,ab.<br>muscle.ti,ab.<br>(exercise adj6 (intoler$ or toler$)).ti,ab. |
| | 5 | | 3 OR 4 | |

The search strategy for the **O outcome** (outcome measures) is as follows:

| O | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | "Quality of Life"/ | OR | quality of life.tw.<br>well?being.ti,ab.<br>(psychological adj3 (functi$ or perform$ or variab$ or chang$ or status)).ti,ab.<br>((physical or fitness) adj3 (functi$ or perform$ or variab$ or chang$ or status)).ti,ab.<br>(physical adj3 fitness).ti,ab.<br>(functional adj3 capacit$).ti,ab.<br>fatigue.ti,ab.<br>(depression or depressive).ti,ab.<br>exp Body Composition/<br>((body adj3 composition) or BMI or (body adj3 fat)).ti,ab.<br>(body adj3 weight).ti,ab.<br>(exercise adj6 intoler$).ti,ab.<br>muscle.ti,ab. |

The search strategy for **F search filters for study types** is as follows:

| F | trefwoorden | operator | woorden in alle velden (af), publicatietype (pt) of tekst (tw) |
|---|---|---|---|
| sysrev | | OR | meta analysis.pt.<br>meta-anal*.af.<br>metaanal*.af.<br>(quantitativ* adj10 review*).tw.<br>(quantitativ* adj10 overview*).tw.<br>(systematic* adj10 review*).tw.<br>(systematic* adj10 overview*).tw.<br>(methodologic* adj10 review*).tw.<br>(methodologic* adj10 overview*).tw.<br>medline.tw. and review-.pt.<br>(pooled adj3 analy*).tw. |
| rct | randomized controlled trial/ | OR | randomized-controlled-trial.pt.<br>controlled-clinical-trial.pt.<br>randomized controlled trials.tw.<br>random-allocation.af.<br>double-blind-method.af.<br>single-blind-method.af.<br>(random adj8 (selection? or sample?)).tw.<br>random*.tw. |

The following strategy was formulated to make the results more **specific** by removing cancer survivors and the palliative phase or to combine it with title words:

| S | trefwoorden | operator | woorden in titel (ti) |
|---|---|---|---|
| 1 | | OR | (cancer adj5 (surviv$ or advanced)).ti.<br>palliative.ti. |
| 2 | | | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti. |
| 3 | | | carcinogenesis.ti. |

Results of this search (all articles are saved in Reference Manager file ‘Oncologische revalidatie - vraag 4',

with the file name as keyword):

| database | bijgewerkt tot | aantal treffers | bestandsnaam |
|---|---|---|---|
| **combinatie: (P or C) and I1 and O and Fsysrev not S1** | | | |
| Medline | 20042009 | 136 | med090421 sysrev |
| Embase | week 16 2009 | 118 | emb090421 sysrev |
| CINAHL | 08052009 | 64 | cin090514 |
| **combinatie: (P and C) and I1 and I2 and Frct and S2 not (S1 or S3)** | | | |
| Medline | 20042009 | 379 | med090421 rct |
| Embase | week 16 2009 | 404 | emb090421 rct |
| PsycINFO | 08052009 | 409 | cin090514 rct |

Limitations: only articles in the Dutch, English or German language, no articles on animal studies, no articles on children and only those from 1999 through to the point in time the search was conducted.

**Question 5: Which form of rehabilitation can prevent/reduce complaints after completing treatment with curative intent?**

A search was performed in Medline (updated to 13042009) via the interface OVID on 14 April 2009 at the CBO in the presence of the development group members J.P. van de Berg and F.M. Hoogwegt. The searches in PsycINFO (via OVID, updated to 04052009) and CINAHL (via EbscoHost, updated to 01052009) were performed in the absence of guideline development group members by the information specialist according to the same search strategy on 8 May 2009.

This PICO was formulated during the search for this question:
**P** *Search strategy for patient population* that was already present
**I** All types of known interventions (see P) also think of: (program* OR "prevention and control" [sh])
**C**
**O** Keywords for less/no complaints and prevention:
(emotional) distress, reduced symptomatology, fear of recurrence, quality of life, improved/prolong$ survival, emotional control, mental adjustment, improved psychological functioning, reduction/decline of stress symptoms, enhanced coping, well-being, self-efficacy, mood changes, pain, sleep, sick role, greater improvement in psychological symptoms, less pain, improve$ mood, improve$ perception of pain, decline in mood disturbance

For the P, the 'cancer survivors' part is used from search strategy *med090421 P cancer rehabilitation version 2* saved in Ovid. The search strategy for this is:

| P | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | exp Neoplasms/<br>exp Radiotherapy/<br>Bone Marrow Transplantation/ | OR | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti,ab.<br>(radioth$ or radiat$ or irradiat$ or radiochemo$ or chemotherap$).ti,ab.<br>(bone marrow adj5 transplant$).ti,ab. |
| 2 | Survivors/ | OR | ((disease-free or disease free) adj3 surviv$).tw. |
| 3 | | 1 AND 2 | |
| 4 | | | ((cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$) adj3 surviv$).tw. |
| 5 | | 3 OR 4 | |

For **I** (intervention = types of rehabilitation), part of the search strategy *med090421 P cancer rehabilitation version 2* saved in Ovid is used, supplemented with a few types of rehabilitation:

| I | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | exp Rehabilitation/<br>exp Exercise Therapy/<br>exp Psychotherapy/<br>Meditation/ | OR | rehabilitat$.ti,ab.<br>(interval train$ or sport$ or movement therap$).tw.<br>stretch$.tw.<br>(dance adj2 (therap$ or exercis$)).tw.<br>(tai ji or tai chi or tai?ji or tai?chi or walk$ or yoga).tw.<br>(psychosocial adj3 (interven$ or therap$ or train$ or activ$ or |

| | | | |
|---|---|---|---|
| | | | exercis$)).tw.<br>((exercise$ or physical$ or resistance or strenght or flexibility or endurance) adj6 (train$ or program$ or interven$ or exercis$)).tw.<br>((resistance or aerobic$ or endurance$) adj3 (exercis$ or train$ or program$ or interven$ or therap$)).tw.<br>(physical$ adj3 (activ$ or therap$ or train$ or exercis$ or interven$ or program$)).tw.<br>psychotherap$.tw.<br>(behavio?r$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(cognitive adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(relax$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>relaxation.ti,ab.<br>(weight adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>exercise.ti,ab.<br>mindfulness.tw.<br>meditation.ti,ab.<br>((person or client) adj3 (intervention or therap$ or treatment or program$)).ti,ab. |

The search strategy for the **O** outcome (prevention or less/no complaints) is as follows:

| **O** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | "Quality of Life"/ | | fatigue.tw.<br>quality of life.tw.<br>(stress or distress or anxiety).tw.<br>pain.tw.<br>((reduc$ or decline$ or less or few$) adj3 symptom$).tw.<br>((psychosocial or psychological or physical) adj3 function$).tw. |

The search strategy for the filter for systematic reviews and meta-analyses *med071129systrev* is as follows:

| **F(sysrev)** | **trefwoorden** | **operator** | **woorden in affiliatie (af), publicatietype (pt) of tekst (tw)** |
|---|---|---|---|
| 1 | | OR | meta analysis.pt.<br>meta-anal*.af.<br>metaanal*.af.<br>(quantitativ* adj10 review*).tw.<br>(quantitativ* adj10 overview*).tw.<br>(systematic* adj10 review*).tw.<br>(systematic* adj10 overview*).tw.<br>(methodologic* adj10 review*).tw.<br>(methodologic* adj10 overview*).tw.<br>medline.tw. and review-.pt.<br>(pooled adj3 analy*).tw. |

The search strategy for the filter for randomised controlled trials *med080617rctCBO* is as follows:

| **F(rct)** | **trefwoorden** | **operator** | **woorden in affiliatie (af), publicatietype (pt) of tekst (tw)** |
|---|---|---|---|
| 1 | randomized controlled trial/ | OR | randomized-controlled-trial.pt.<br>controlled-clinical-trial.pt.<br>randomized controlled trials.tw.<br>random-allocation.af.<br>double-blind-method.af.<br>single-blind-method.af<br>(random adj8 (selection? or sample?)).tw.<br>random*.tw. |

This search strategy (T) is used for the prevention component:

| **T** | **trefwoorden** | **operator** | **woorden in tekst (tw)** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 1 | | | ((preventi$ or protect$) adj3 (program$ or therap$ or intervention$)).tw. |

Given there were a lot of hits with the combination med090414 question 5 rct in Embase, this was combined with (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti..

**Results of this search** (all articles are saved in Reference Manager file 'Oncologische revalidatie - vraag 5', with the file name as keyword):

| **database** | **aantal treffers** | **bestandsnaam** |
|---|---|---|
| **combinatie: P AND I AND O AND F(sysrev)** | | |
| Medline | 28 | med090414 vraag 5 sysrev |
| Embase | 75 | emb090414 vraag 5 sysrev |
| PsycINFO | 19 | psy090508 vraag 5 sysrev |
| CINAHL | 12 | cin090508 vraag 5 sysrev |
| **combinatie: P AND I AND O AND F(rct)** | | |
| Medline | 141 | med090414 vraag 5 rct |
| Embase | 289 | emb090414 vraag 5 rct |
| PsycINFO | 23 | psy090508 vraag 5 rct |
| CINAHL | 113 | cin090508 vraag 5 rct |
| **combinatie: P AND I AND T** | | |
| Medline | 9 | med090414 vraag 5 preventie |
| Embase | 20 | emb090414 vraag 5 preventie |
| PsycINFO | 4 | psy090508 vraag 5 preventie |
| CINAHL | 0 | cin090508 vraag 5 preventie |

Limitations: no articles that are exclusively about animals, only articles in the Dutch, English and German language, and only articles from 1999 through to 2009.

**Question 6: Clinical question: Which form of rehabilitation can prevent/reduce complaints during the (disease-focused and symptom-focused) palliative phase?**

A search was performed for this question in Medline, Embase and PsycINFO (all via the interface OvidSP) on 25 May 2009 in the presence of the development group member S.C.C.M. Teunissen.

The search strategy for the **P (patient population)** is:

| **P** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | | OR | (advanc$ adj2 (cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$)).tw.<br>(palliative adj (treatment$ or care or medicine)).ti,ab. |

The search strategy for the **I intervention** (rehabilitation here, part 'types of rehabilitation' of the saved search strategy *med090421 P cancer rehabilitation version 2* is as follows.

| **I** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | exp Rehabilitation/<br>exp Exercise Therapy/<br>exp Psychotherapy/<br>Meditation/ | OR | rehabilitat$.ti,ab.<br>(interval train$ or sport$ or movement therap$).tw.<br>stretch$.tw.<br>(dance adj2 (therap$ or exercis$)).tw.<br>(tai ji or tai chi or tai?ji or tai?chi or walk$ or yoga).tw.<br>(psychosocial adj3 (interven$ or therap$ or train$ or activ$ or exercis$)).tw.<br>((exercise$ or physical$ or resistance or strenght or flexibility or endurance) adj6 (train$ or program$ or interven$ or exercis$)).tw.<br>((resistance or aerobic$ or endurance$) adj3 (exercis$ or train$ or program$ or interven$ or therap$)).tw.<br>(physical$ adj3 (activ$ or therap$ or train$ or exercis$ or interven$ or program$)).tw. |

| | | | |
|---|---|---|---|
| | | | psychotherap$.tw.<br>(behavio?r$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(cognitive adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(relax$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>relaxation.ti,ab.<br>(weight adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>exercise.ti,ab.<br>mindfulness.tw.<br>meditation.ti,ab.<br>((person or client) adj3 (intervention or therap$ or treatment or program$)).ti,ab. |

The search strategy for the **O outcome** (outcome measures) is as follows:

| **O** | **trefwoorden** | **operator** | **woorden in titel (ti) of abstract (ab)** |
|---|---|---|---|
| 1 | | OR | (symptom$ adj5 burden).ti,ab.<br>(symptom$ adj5 (palliation or management)).ti,ab.<br>(symptom$ adj5 prevalence).ti,ab.<br>(symptom$ adj5 distress).ti,ab. |
| 2 | exp prognosis/<br>"Quality of Life"/ | OR | ((prevent$ or reduc$ or declin$ or less or protect$ or few$ or alleviat$ or improve$ or manag$) adj5 symptom$).ti,ab.<br>survival.ti,ab.<br>prognosis.ti,ab.<br>quality of life.ti,ab. |

The following strategy is formulated to make the results **more specific** and limit the number of hits:

| **S** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | | OR | (cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$).ti. |

Results of this search (all articles are saved in Reference Manager file 'Oncologische revalidatie - vraag 6', with the file name as keyword):

| **database** | **bijgewerkt tot** | **aantal treffers** | **bestandsnaam** |
|---|---|---|---|
| **combinatie: P and O1 and O2 and S1 and I** | | | |
| Medline | 22052009 | 29 | med090525 vraag 6 |
| Embase | week 21 2009 | 60 | emb090525 vraag 6 |
| PsycINFO | 18052009 | 22 | psy090525 vraag 6 |

Limitations: only articles in the Dutch and English language, only articles on human studies and only those from 1999 through to the point in time the search was conducted.

**Question 7: Which instrument is valid and usable in the Netherlands for screening cancer-related fatigue during and after completing treatment with curative intent and in the (disease-focused and symptom-focused) palliative phase?**

First search

A search was performed in Medline (updated to 13052009) on 14 May 2009 at the CBO in the presence of the development group member S.L. Wanders via de interface OVID. The search in Embase (updated to week 21 2009; also via OVID) and CINAHL (updated to 22052009, via EbscoHost) is performed according to the same search strategy on 29 May 2009.

This PICO was formulated during the search for this question:

**P** All cancer patients (see P)
**I** All known instruments
**C**
**O** validity, validat$, effective, effect$, evidence, method, select$, evaluat$, indentificat$, useful,

reliable, predict$, reproduce$, specific$, sensitive$, feasib$ MeSH: sensitivity and specificity, MeSH: predictive value of tests, MeSH: reproducibility of results, MeSH: evaluation studies as topic, MeSH: feasibility studies, MeSH: validation studies as topic
Components were adjusted during the search following consultation.

Only the first part ('cancer and cancer treatment') of the search strategy for *med090421 P cancer rehabilitation version 2* saved in Ovid was used for the P. The search strategy for this is:

| P | trefwoorden | operator | woorden in titel (ti) of abstract (ab) |
|---|---|---|---|
| 1 | exp Neoplasms/<br>exp Radiotherapy/<br>Bone Marrow Transplantation/ | OR | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti,ab.<br>(radioth$ or radiat$ or irradiat$ or radiochemo$ or chemotherap$).ti,ab.<br>(bone marrow adj5 transplant$).ti,ab. |

The below search strategy was used for I (instruments). Line 2 was added at the end of the search strategy in order to make the result more specific.

| I | trefwoorden | operator | woorden in titel (ti) of abstract (ab) |
|---|---|---|---|
| 1 | exp Questionnaires/ or exp Health Surveys/<br>"Quality of Life"/<br>Pain Measurement/<br>Psychometrics/is [Instrumentation] | OR | (questionnaire$ or instrument$).ti,ab.<br>checklist$.ti,ab.<br>inventor$.ti,ab.<br>assessment$.ti,ab.<br>(measur$ adj3 pain).ti,ab.<br>(screening adj3 (list$ or instrument$ or checklist$ or questionnaire$ or assessment$ or inventor$)).ti,ab. |
| 2 | | AND | (list$ or instrument$ or checklist$ or questionnaire$ or assessment$ or inventor$ or survey or scale$).ti. |

Cancer patients have developed complaints as a result of the cancer and treatment. The search strategy for these complaints (**K**) is as follows:

| K | trefwoorden | operator | woorden in titel (ti) of abstract (ab) |
|---|---|---|---|
| 1 | Fatigue/<br>exp Pain/<br>Paresthesia/<br>Lymphedema/ | OR | fatigue.ti,ab.<br>pain.ti,ab.<br>vitality.ti,ab.<br>(muscle adj6 streng$).ti,ab.<br>fitness.ti,ab.<br>(physical adj3 (capacity or function$)).ti,ab.<br>(walk$ or mobility).ti,ab.<br>(breathlessness or short of breath).ti,ab.<br>(functional adj3 independ$).ti,ab.<br>((neurological adj3 symptom$) or neuropath$ or myelopath$).ti,ab.<br>paresthesi$.ti,ab.<br>lymph?edema.ti,ab.<br>(return to work or return-to-work).ti,ab.<br>(social adj3 (functi$ or perform$ or variab$ or chang$ or status)).ti,ab.<br>(physical adj3 activ$).ti,ab. |

The search strategy for the validation of the measuring instrument (**V)** is as follows:

| V | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | "sensitivity and specificity"/<br>"predictive value of tests"/<br>"reproducibility of results"/<br>feasibility studies/ | OR | (reliab$ or predict$ or reproduc$ or specific$ or sensitiv$ or feasib$ or accura$).ti,ab.<br>valid$.ti,ab. |

The search strategy for the filter for systematic reviews and meta-analyses *med071129systrev* is as

follows:

| F(sysrev) | Tref-woorden | operator | woorden in affiliatie (af), publicatietype (pt) of tekst (tw) |
|---|---|---|---|
| 1 | | OR | meta analysis.pt.<br>meta-anal*.af.<br>metaanal*.af.<br>(quantitativ* adj10 review*).tw.<br>(quantitativ* adj10 overview*).tw.<br>(systematic* adj10 review*).tw.<br>(systematic* adj10 overview*).tw.<br>(methodologic* adj10 review*).tw.<br>(methodologic* adj10 overview*).tw.<br>medline.tw. and review-.pt.<br>(pooled adj3 analy*).tw. |

The search strategy for the filter for randomised controlled trials *med080617rctCBO* is as follows:

| F(rct) | trefwoorden | operator | woorden in affiliatie (af), publicatietype (pt) of tekst (tw) |
|---|---|---|---|
| 1 | randomized controlled trial/ | OR | randomized-controlled-trial.pt.<br>controlled-clinical-trial.pt.<br>randomized controlled trials.tw.<br>random-allocation.af.<br>double-blind-method.af.<br>single-blind-method.af<br>(random adj8 (selection? or sample?)).tw.<br>random*.tw. |

**Results of this search** (all articles are saved in Reference Manager file 'Oncologische revalidatie - vraag 7', with the file name as keyword):

| database | aantal treffers | bestandsnaam |
|---|---|---|
| **combinatie: P AND I AND K AND V** | | |
| Medline | 578 | med090514 |
| CINAHL | 160 | cin090529 |
| **combinatie: P AND I AND K AND V AND F(sysrev)** | | |
| Embase | 19 | emb090529 sysrev |
| **combinatie: P AND I AND K AND V AND F(rct) (limitering 2007 - current)** | | |
| Embase | 584 | emb090529 rct va 2007 |

Limitations: no articles that are exclusively about animals, only articles in the Dutch, English or German language, only articles about adults (>18 years of age) and only articles from 1999 through to 2009.

Second search

A second search was conducted in Medline after adjusting the clinical question, now specifically searching for instruments for the screening of cancer-related fatigue.

Search strategy:

| # | Zoektermen | Hits |
|---|---|---|
| 1 | exp Fatigue/ci, cl, co, di, et, px, rh, th [Chemically Induced, Classification, Complications, Diagnosis, Etiology, Psychology, Rehabilitation, Therapy] | 8300 |
| 2 | exp *Psychometrics/ | 5094 |
| 3 | exp "Reproducibility of Results"/ | 196986 |
| 4 | (sensitivity and specificity).mp. [mp=title, original title, abstract, name of substance word, subject heading word, unique identifier] | 281086 |
| 5 | measurement.mp. | 320172 |
| 6 | 2 or 3 or 4 or 5 | 698690 |
| 7 | exp Neoplasms/cl, co, di, dt, ep, px, rt, rh, th [Classification, Complications, Diagnosis, Drug Therapy, Epidemiology, Psychology, Radiotherapy, Rehabilitation, Therapy] | 1045039 |
| 8 | cancer.mp. | 723546 |
| 9 | 7 or 8 | 1414255 |

| | | |
|---|---|---|
| 10 | tiredness.mp. | 2033 |
| 11 | 1 or 10 | 10055 |
| 12 | 6 and 9 and 11 | 192 |

Articles were included if they met the below inclusion criteria.
*Inclusion criteria:*

| | **Inclusiecriteria: studies werden geïncludeerd als het studies betrof bij/naar:** |
|---|---|
| P | volwassen kankerpatiënten onder behandeling (curatief of palliatief) of als *cancer survivors.* |
| I | screeningsinstrument voor kanker gerelateerde vermoeidheid |
| O | met als uitkomst rapportage over de sensitiviteit / specificiteit van het screeningsinstrument |

**Question 8: What should the intake consist of in order to determine which form of rehabilitation is the most suitable for a specific patient?**
*Research question:*
*Which form of intake is the best indicator of which rehabilitation is the best for which patient?*
*M.J. Velthuis: What components should the intake consist of in order to determine which form of cancer rehabilitation is the best for which patient?*

A search was performed in Medline on 23 June 2009 at the CBO in the presence of the development group members L.J. Slot and G. Schep via de interface OVIDSP. This search was then left for a while. It was decided at the end of August to conduct the original search again after a few adjustments and to finish it in Embase, CINAHL and PsycINFO for 2 components. The search strategy for this search has been noted under 'Second search'.

This PICO was formulated during the search for this question:
**P** All types of cancer rehabilitation (see P: watch for the distinction curative and palliative phase)
Problems experienced by cancer patients (different per phase): rijtje G. Schep
**I** Intake for physical and psychosocial problems
**C**
**O** Least dropouts, best effects (of rehabilitation)
Components of the PICO are adjusted during the search.

First search
From the search strategy *med090421 P cancer rehabilitation version 2* saved in Ovid, the following search strategy is used for the **P**, **cancer and patients in all cancer phases** (curative, palliative, survivors):

| **Pp** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | exp Neoplasms/<br>exp Radiotherapy/<br>Bone Marrow Transplantation/ | OR | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti,ab.<br>(radioth$ or radiat$ or irradiat$ or radiochemo$ or chemotherap$).ti,ab.<br>(bone marrow adj5 transplant$).ti,ab. |
| 2 | Survivors/ | OR | ((disease-free or disease free) adj3 surviv$).tw. |
| 3 | | 1 AND 2 | |
| 4 | | | ((cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$) adj3 surviv$).tw. |
| 5 | | 3 OR 4 | |
| 6 | palliative care/ or exp terminal care/<br>Terminally Ill/ | OR | (palliative adj (treatment$ or care or caring)).ti,ab. |
| 7 | | 1 AND 6 | |
| 8 | | | (advanc$ adj2 (cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$)).tw. |

| | | | |
|---|---|---|---|
| 9 | | 7 OR 8 | |
| 10 | exp treatment outcome/ | OR | (curative adj3 (treatment$ or care or caring)).ti,ab. |
| 11 | | 1 AND 10 | |
| 12 | | | ((cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$) adj3 treat$).tw. |
| 13 | | 1 OR 5 OR 9 OR 12 | |

From the search strategy *med090421 P cancer rehabilitation version 2* saved in Ovid, the following search strategy is used for the **Pr**, **types of rehabilitation**:

| **Pr** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | exp Rehabilitation/<br>exp Exercise Therapy/<br>exp Psychotherapy/<br>Meditation/ | OR | rehabilitat$.ti,ab.<br>(interval train$ or sport$ or movement therap$).tw.<br>stretch$.tw<br>(dance adj2 (therap$ or exercis$)).tw.<br>(tai ji or tai chi or tai?ji or tai?chi or walk$ or yoga).tw.<br>(psychosocial adj3 (interven$ or therap$ or train$ or activ$ or exercis$)).tw.<br>((exercise$ or physical$ or resistance or strenght or flexibility or endurance) adj6 (train$ or program$ or interven$ or exercis$)).tw.<br>((resistance or aerobic$ or endurance$) adj3 (exercis$ or train$ or program$ or interven$ or therap$)).tw.<br>(physical$ adj3 (activ$ or therap$ or train$ or exercis$ or interven$ or program$)).tw.<br>psychotherap$.tw.<br>(behavio?r$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(cognitive adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(relax$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>relaxation.ti,ab.<br>(weight adj3 (train$ or program$ or exercis$ or interven$ or therap$ or activ$)).tw.<br>exercise.ti,ab.<br>mindfulness.tw.<br>meditation.ti,ab.<br>((person or client) adj3 (intervention or therap$ or treatment or program$)).ti,ab. |

The search strategy for **I intervention, i.e. functional tests** (for the physical component of the question):

| **I** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | Exercise Test/<br>exp Respiratory Function Tests/<br>Oxygen Consumption/<br>exp Muscle Strength/<br>Cachexia/<br>Lymphedema/ | OR | (exercise adj3 (test$ or measur$ or evaluat$ or physolo$ or assessment)).ti,ab.<br>(respirator$ adj5 (test$ or measur$ or evaluat$ or assessment)).ti,ab.<br>(cardiorespirator$ adj5 (test$ or measur$ or evaluat$ or assessment)).ti,ab.<br>(oxygen adj3 (consumption or uptake)).ti,ab.<br>(muscle adj3 strength adj3 (test$ or measur$ or evaluat$ or assessment)).ti,ab.<br>((weight or muscle) adj3 loss).ti,ab.<br>((neuromuscular or neuropath$ or paresthes$) adj3 (test$ or measur$ or evaluat$ or assessment or scale)).ti,ab.<br>(lymph?edema or (shoulder adj3 (problem$ or pain or dysfunction$ or function) adj3 (test$ or measur$ or evaluat$ or assessment or scale))).ti,ab. |
| 2 | | | |

| | | | |
|---|---|---|---|
| | | | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti. |
| 3 | | 1 AND 2 | |
| 4 | | | (cancer adj2 (prevent$ or risk)).ti. |
| 5 | | 3 NOT 4 | |

This **I** can be expanded with these components (**lu**):

| lu | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | body composition/ or body fat distribution/ or adiposity/<br>body weight/ or exp body weight changes/ or exp overweight/ or thinness/<br>body mass index/ or skinfold thickness/<br>Muscular Atrophy/ | OR | (fat adj2 free adj2 mass).ti,ab.<br>(cachex$ or fat distribution or thinness or (cachectic adj2 obes$) or skinfold thickness or (atroph$ adj2 musc$)).ti,ab. |

The search strategy for **Ip intervention, i.e. functional tests** (for the psychosocial component of the question):

| I | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | Questionnaires/<br>"Quality of Life"/ | OR | ((psychological or psychosocial or social) adj3 (test$ or measur$ or evaluat$ or assessment or scale)).ti,ab.<br>((depression or anxiety or fear or self-efficacy or selfefficacy self-esteem or selfesteem or distress or mental stress or cognitive or fatigue) adj5 (test$ or measur$ or evaluat$ or assessment or scale)).ti,ab.<br>(coping or mental adjustment or competence or social support or motivation).ti,ab.<br>quality of life.ti,ab.<br>(responses adj3 stress questionnaire$).ti,ab.<br>mental adjustment to cancer scale.tw.<br>(basic documentation adj3 (psycho-oncology or psychooncology)).tw.<br>distress thermometer.tw.<br>(hospital anxiety and depression scale).tw.<br>patient questionnaire for assessment of rehabilitation motivation.tw.<br>((sexual or relation$) adj3 problem$).tw. |

The search strategy for **S (psychosocial scales)** is:

| S | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | | OR | (responses adj3 stress questionnaire$).ti,ab.<br>mental adjustment to cancer scale.tw.<br>(basic documentation adj3 (psycho-oncology or psychooncology)).tw.<br>distress thermometer.tw.<br>(hospital anxiety and depression scale).tw.<br>patient questionnaire for assessment of rehabilitation motivation.tw. |
| 2 | | | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti. |
| 3 | | 1 AND 2 | |

The search strategy for the filter for systematic reviews and meta-analyses *med071129systrev* is as follows:

| Fsysrev | trefwoorden | operator | woorden in affiliatie (af), publicatietype (pt) of tekst (tw) |
|---|---|---|---|
| 1 | | OR | meta analysis.pt.<br>meta-anal*.af.<br>metaanal*.af.<br>(quantitativ* adj10 review*).tw.<br>(quantitativ* adj10 overview*).tw.<br>(systematic* adj10 review*).tw. |

| | | | |
|---|---|---|---|
| | | | (systematic* adj10 overview*).tw.<br>(methodologic* adj10 review*).tw.<br>(methodologic* adj10 overview*).tw.<br>medline.tw. and review-.pt.<br>(pooled adj3 analy*).tw. |

**Results of this search** (these articles are not saved in Reference Manager):

| **database** | **bijgewerkt tot:** | **aantal treffers** | **bestandsnaam** |
|---|---|---|---|
| **combinatie: Pp AND Pr AND I** | | | |
| Medline | 22 juni 2009 | 389 | med090623 fysiek |
| **combinatie: Pr AND (I OR Iu) AND Fsysrev** | | | |
| Medline | 22 juni 2009 | 56 | med090623 fysiek sysrev |
| **combinatie: Pp AND Pr AND Ip AND Fsysrev** | | | |
| Medline | 22 juni 2009 | 105 | med090623 psycho sysrev |
| **combinatie: Pp AND S** | | | |
| Medline | 22 juni 2009 | 320 | med090623 psycho scales |

Limitations: no articles that are exclusively about animals, only articles in the Dutch, English or German language, articles about children (to 18 years of age) are excluded, and only articles from 1999 through to 2009.

Second search
The **Pp** and **Pr** have not been adjusted.

The search strategy for **If intervention, i.e. functional tests** (for the physical component of the question):

| **If** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | Exercise Test/<br>exp Respiratory Function Tests/<br>Oxygen Consumption/<br>exp Muscle Strength/<br>Cachexia/<br>Lymphedema/ | OR | (exercise adj3 (test$ or measur$ or evaluat$ or physolo$ or assessment)).ti,ab.<br>(respirator$ adj5 (test$ or measur$ or evaluat$ or assessment)).ti,ab.<br>(cardiorespirator$ adj5 (test$ or measur$ or evaluat$ or assessment)).ti,ab.<br>(oxygen adj3 (consumption or uptake)).ti,ab.<br>(muscle adj3 strength adj3 (test$ or measur$ or evaluat$ or assessment)).ti,ab.<br>((weight or muscle) adj3 loss).ti,ab.<br>((neuromuscular or neuropath$ or paresthes$) adj3 (test$ or measur$ or evaluat$ or assessment or scale)).ti,ab.<br>(lymph?edema or (shoulder adj3 (problem$ or pain or dysfunction$ or function) adj3 (test$ or measur$ or evaluat$ or assessment or scale))).ti,ab. |

The search strategy for **Ip intervention, i.e. functional tests** (for the psychosocial component of the question):

| **Ip** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | Questionnaires/<br>"Quality of Life"/ | OR | ((psychological or psychosocial or social) adj3 (test$ or measur$ or evaluat$ or assessment or scale)).ti,ab.<br>((depression or anxiety or fear or self-efficacy or selfefficacy or self-esteem or selfesteem or distress or mental stress or cognitive or fatigue) adj5 (test$ or measur$ or evaluat$ or assessment or scale)).ti,ab.<br>(coping or mental adjustment or competence or social support or motivation).ti,ab.<br>quality of life.ti,ab.<br>((sexual or relation$) adj3 problem$).tw. |

The search strategy for **S (psychosocial scales)** is:

| **S** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 1 | | OR | (responses adj3 stress questionnaire$).ti,ab.<br>mental adjustment to cancer scale.tw.<br>(basic documentation adj3 (psycho-oncology or psychooncology)).tw.<br>distress thermometer.tw.<br>(hospital anxiety and depression scale).tw.<br>patient questionnaire for assessment of rehabilitation motivation.tw. |

The search strategy used for the **O, i.e. the prevention/improvement of complaints and the best effects of rehabilitation**

| O | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | Patient Satisfaction/<br>"Quality of Life"/<br>"Activities of Daily Living"/ | OR | (satisfact$ adj4 (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$) adj4 patient$).ti,ab<br>quality of life.ti,ab.<br>((less or few$ or reduc$ or diminish$) adj3 (complain$ or pain or fatigue)).ti,ab.<br>((improv$ or better or enhanc$) adj3 (function$ or perform$ or abilit$ or able)).ti,ab. |

To limit the results, the following search strategy was used:

| G | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | | | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$ or exercise or program$ or rehabilitat$).ti. |

**Results of this search** (all articles are saved in Reference Manager file 'Oncologische revalidatie - vraag 8', with the file name as keyword):

| database | bijgewerkt tot: | aantal treffers | bestandsnaam |
|---|---|---|---|
| **combinatie: Pp AND Pr AND If AND O AND G** | | | |
| Medline | 28 augustus 2009 | 227 | med090831 fysiek |
| Embase | week 35 2009 | 262 | emb090901 fysiek |
| CINAHL | 28 augustus 2009 | 94 | cin090904 fysiek |
| **combinatie: Pp AND Pr AND If AND O AND Fsysrev** | | | |
| Medline | 28 augustus 2009 | 18 | med090831 fysiek sysrev |
| Embase | week 35 2009 | 24 | emb090901 fysiek sysrev |
| CINAHL | 28 augustus 2009 | 15 | cin090904 fysiek sysrev |
| **combinatie: Pp AND Pr AND Ip AND O AND Fsysrev (zonder eerdere downloads)** | | | |
| Medline | 28 augustus 2009 | 110 | med090831 psycho sysrev |
| Embase | week 35 2009 | 193 | emb090901 psycho sysrev |
| CINAHL | 28 augustus 2009 | 60 | cin090904 psycho sysrev |
| PsycINFO | 31 augustus 2009 | 45 | psy090904 psycho sysrev |
| **combinatie: Pp AND Pr AND S (zonder eerdere downloads)** | | | |
| Medline | 28 augustus2009 | 80 | med090831 psycho scales |
| Embase | week 35 2009 | 93 | emb090901 psycho scales |
| CINAHL | 28 augustus 2009 | 95 | cin090904 psycho scales |
| PsycINFO | 31 augustus 2009 | 34 | psy090904 psycho scales |

**Question 9: Which measuring instruments are valid and usable in the Netherlands for the effect evaluation of cancer rehabilitation during and after completing treatment with curative intent and in the (disease-focused and symptom-focused) palliative phase?**

First search

A search was performed in Medline (updated to 24042009) on 27 April 2009 at the CBO in the presence of the development group member H.M. Wittink and A.V. Ranchor via the interface OVID. The search in Embase (also via OVID; updated to week 20 2009), was performed by the information specialist on 18 May 2009 in line with the same search strategy and in the absence of guideline development group members.

This PICO was formulated before the search was conducted:

**P** All types of cancer rehabilitation (see P)
**I** All known measuring instruments
**C**
**O** validity, validat$, effective, effect$, evidence, method, select$, evaluat$, indentificat$, useful, reliable, predict$, reproduce$, specific$, sensitive$, feasib$ MeSH: sensitivity and specificity, MeSH: predictive value of tests, MeSH: reproducibility of results, MeSH: evaluation studies as topic, MeSH: feasibility studies, MeSH: validation studies as topic

Search terms were adjusted during the search.
The first part ('cancer and cancer treatment') of the search strategy for *med090421 P cancer rehabilitation version 2* saved in Ovid was used for the P. Due to the large number of hits, this strategy for the RCT's from Embase is expanded with lines 2 and 3:

| P | trefwoorden | operator | woorden in titel (ti) of abstract (ab) |
|---|---|---|---|
| 1 | exp Neoplasms/<br>exp Radiotherapy/<br>Bone Marrow Transplantation/ | OR | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti,ab.<br>(radioth$ or radiat$ or irradiat$ or radiochemo$ or chemotherap$).ti,ab.<br>(bone marrow adj5 transplant$).ti,ab. |
| 2 | | | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti. |
| 3 | | 1 AND 2 | |

For **I** (intervention = types of rehabilitation), the component 'types of rehabilitation' of the search strategy *med090421 P cancer rehabilitation version 2* saved in Ovid is adjusted as follows:

| I | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | exp Rehabilitation/<br>exp Exercise Therapy/<br>exp Psychotherapy/<br>Meditation/ | OR | rehabilitat$.ti,ab.<br>(interval train$ or sport$ or movement therap$).tw.<br>stretch$.tw.<br>(dance adj2 (therap$ or exercis$)).tw.<br>(tai ji or tai chi or tai?ji or tai?chi or walk$ or yoga).tw.<br>(psychosocial adj3 (interven$ or therap$ or train$ or activ$ or exercis$)).tw.<br>((exercise$ or physical$ or resistance or strenght or flexibility or endurance) adj6 (train$ or program$ or interven$ or exercis$)).tw.<br>((resistance or aerobic$ or endurance$) adj3 (exercis$ or train$ or program$ or interven$ or therap$)).tw.<br>(physical$ adj3 (activ$ or therap$ or train$ or exercis$ or interven$ or program$)).tw.<br>psychotherap$.tw.<br>(behavio?r$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(cognitive adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(relax$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>relaxation.ti,ab.<br>(weight adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>exercise.ti,ab.<br>mindfulness.tw.<br>meditation.ti,ab.<br>((person or client) adj3 (intervention or therap$ or treatment or program$)).ti,ab. |
| 2 | | OR | ((exercise$ or physical$ or resistance or strenght or flexibility or endurance) adj6 (train$ or program$ or interven$ or exercis$)).tw.<br>((resistance or aerobic$ or endurance$) adj3 (exercis$ or train$ or program$ or interven$ or therap$)).tw.<br>(physical$ adj3 (activ$ or therap$ or train$ or exercis$ or interven$ or program$)).tw. |

| | | | |
|---|---|---|---|
| 3 | | 1 AND 2 | |

The search strategy for the **O** outcome (quality of life etc.) is as follows:

| O | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | "Quality of Life"/<br>exp Body Composition/<br>exp Pain/<br>"activities of daily living"/<br>work/<br>exp Respiratory Function Tests/ | OR | quality of life.ti,ab.<br>distress.ti,ab.<br>well?being.ti,ab.<br>(psychological adj3 (functi$ or perform$ or variab$ or chang$ or status)).ti,ab.<br>((physical or fitness) adj3 (functi$ or perform$ or variab$ or chang$ or status)).ti,ab.<br>(physical adj3 fitness).ti,ab.<br>(functional adj3 capacit$).ti,ab.<br>fatigue.ti,ab.<br>(depression or depressive).ti,ab.<br>((body adj3 composition) or BMI or (body adj3 fat)).ti,ab.<br>(body adj3 weight).ti,ab.<br>(exercise adj6 (intoler$ or toler$)).ti,ab.<br>muscle.ti,ab.<br>(social adj3 (functi$ or perform$ or variab$ or chang$ or status)).ti,ab.<br>(physical adj3 activ$).ti,ab.<br>pain.ti,ab.<br>(return-to-work or return to work).ti,ab.<br>vitality.ti,ab.<br>role function$.ti,ab.<br>work.ti,ab.<br>((lung or respiratory) adj3 test$).ti,ab.<br>((performance or functional or capacity) adj3 test$).ti,ab. |

The search strategy for **S** study types is as follows:

| S | trefwoorden | operator | woorden in tekst (tw) |
|---|---|---|---|
| 1 | | | ((longitudinal$ or quasi?experiment$) adj4 (study or studies)).tw. |

The search strategy for **T** treatment is as follows:

| T | trefwoorden | operator | woorden in titel (ti) of abstract (ab) |
|---|---|---|---|
| 1 | | | (intervention$ or treatment or program$ or therap$ or rehab$).ti,ab. |

The search strategy for **M** measurement is as follows

| M | trefwoorden | operator | woorden in titel (ti) of abstract (ab) |
|---|---|---|---|
| 1 | | | (measurement or outcome).ti,ab. |

The search strategy for **C** psychometric is as follows:

| C | trefwoorden | operator | woorden in de tekst (tw) |
|---|---|---|---|
| 1 | | | psychometric$.tw. |

The search strategy for the filter for systematic reviews and meta-analyses *med071129systrev* is as follows:

| F(sysrev) | trefwoorden | operator | woorden in affiliatie (af), publicatietype (pt) of tekst (tw) |
|---|---|---|---|
| 1 | | OR | meta analysis.pt.<br>meta-anal*.af.<br>metaanal*.af.<br>(quantitativ* adj10 review*).tw.<br>(quantitativ* adj10 overview*).tw.<br>(systematic* adj10 review*).tw.<br>(systematic* adj10 overview*).tw.<br>(methodologic* adj10 review*).tw.<br>(methodologic* adj10 overview*).tw.<br>medline.tw. and review-.pt.<br>(pooled adj3 analy*).tw. |

The search strategy for the filter for randomised controlled trials *med080617rctCBO* is as follows:

| F(rct) | trefwoorden | operator | woorden in affiliatie (af), publicatietype (pt) of tekst (tw) |
|---|---|---|---|
| 1 | randomized controlled trial/ | OR | randomized-controlled-trial.pt.<br>controlled-clinical-trial.pt.<br>randomized controlled trials.tw.<br>random-allocation.af.<br>double-blind-method.af.<br>single-blind-method.af<br>(random adj8 (selection? or sample?)).tw.<br>random*.tw. |

**Results of this search** (all articles are saved in Reference Manager file 'Oncologische revalidatie - vraag 9', with the file name as keyword):

| database | aantal treffers | bestandsnaam |
|---|---|---|
| **combinatie: P AND I AND O AND S** | | |
| Medline | 53 | med090427 long |
| Embase | 45 | emb090518 long |
| **combinatie: P AND I AND O AND T AND F(rct)** | | |
| Medline | 457 | med090427 rct |
| Embase | 452 | emb090518 rct |
| **combinatie: P AND I AND O AND M AND F(sysrev)** | | |
| Medline | 27 | med090427 sysrev |
| Embase | 28 | emb090518 sysrev |
| **combinatie: P AND M AND C** | | |
| Medline | 131 | med090427 psychometric |
| Embase | 116 | emb090518 psychometric |

Limitations: no articles that are exclusively about animals, only articles in the Dutch or English language, no articles about children (to 18 years of age), and only articles from 1999 through to 2009.

Second search
Part of the search is repeated on the basis of comments by H. M. Wittink in an email dated 19 June 2009 regarding studies that are missing in the result of the first search. The missing studies have been sent by H.M. Wittink. This search was performed in Medline (updated to 6 July 2009) and Embase (updated to week 27 2009) via the interface OVidSP on 7 July 2009.

The P, I and O of the first search are used again here, as is the filter for RCT's. Two extra search lines are also used, namely:
a search line for **S**, search terms in the title to make the result more **selective** and limit the number of hits, as follows:

| S | trefwoorden | operator | woorden in de titel (ti) |
|---|---|---|---|
| 1 | set 156 | | (exercise or assessment or physical$ activ$ or rehabilitation or intervention).ti. |

a search line for **Ia**, general search terms for **intervention**, as follows:

| Ia | trefwoorden | operator | woorden in de titel (ti) of abstract (ab) |
|---|---|---|---|
| 1 | set 119 | | (intervention$ or treatment or program$ or therap$ or rehab$).ti,ab. |

**Results of this search** (all articles are saved in Reference Manager file 'OncoReval - vraag 9 rct's herhaling', with the file name as keyword):

| database | aantal treffers | bestandsnaam |
|---|---|---|
| **combinatie: P AND I AND O AND Ia AND F(rct) AND S** | | |
| Medline | 205 | med090707 rct herhaling |
| Embase | 281 | emb090707 rct herhaling |

Third search
A third search and selection was conducted by H.M. Wittink and A.V. Ranchor.

*Patient:* All oncological disorders, all phases of the disease
*Intervention:* Rehabilitation interventions in patients with oncological disorders. Lifestyle studies were excluded, i.e. studies in which patients received advice to exercise at home and in which no functions such as strength and aerobic capacity were measured.
*Outcome:* Measuring instruments/physical tests used to determine the effects of cancer rehabilitation
Limitation: Language (Dutch, English, German); Year (1999 to January 2010), design: RCT.

An inventory was subsequently made of the measuring instruments used in the selected studies and a new search was performed for psychometric characteristics (reliability, validity, responsiveness etc.).

Conditions:

- If a questionnaire is involved, it must be available in Dutch
- Preferably tested in/on the Dutch population
- Tested on cancer patients
- Generic cancer instrument
- Preferably in the public domain
- Be responsive/sensitive to changes + reliable and valid
- Responsive on an individual level

Psychometrische search:
Gezocht werd op Health related Quality of life instrumenten per instrument

| | | |
|---|---|---|
| #39 | Search "Quality of life index for cancer patients" AND #15 | 35 |
| #38 | Search "Quality of life index for cancer patients" AND #15 AND cancer | 35 |
| #37 | Search "satisfaction with life scale" AND #15 AND cancer | 0 |
| #36 | Search satisfaction with life scale AND #15 AND cancer | 9 |
| #35 | Search RAND-36 AND #15 AND cancer | 0 |
| #33 | Search "Aaronson NK"[Author] AND SF-36 AND cancer | 15 |
| #32 | Search "Aaronson NK"[Author] | 183 |
| #29 | Search SF-36 AND #15 AND cancer | 16 |
| #28 | Search SF-36 AND #15 | 338 |
| #26 | Search EORTC QLQ C30 AND #15 | 18 |
| #25 | Search Rotterdam Symptom Check List AND #15 | 1 |
| #24 | Search WHOQOL-BREF AND #15 | 12 |
| #22 | Search WHOQOL-BREF AND #15 AND cancer | 0 |
| #21 | Search facit-f AND #15 | 1 |
| #20 | Search fact-f AND #15 | 0 |
| #19 | Search fact-p AND #15 | 1 |
| #18 | Search fact-g AND #15 | 16 |
| #17 | Search fact-b breast AND #15 | 3 |
| #16 | Search fact-b breast | ? |
| #15 | Search #12 OR #13 OR #14 | 37566 |
| #14 | Search sensitivity to change | 32755 |
| #13 | Search minimal clinical important difference | 374 |
| #12 | Search responsiveness scale | ? |

Vervolgens activiteiten: (geen hits)

| | | |
|---|---|---|
| #44 | Search "Physical Activity Scale for the Elderly" AND #15 AND cancer | 13 |
| #43 | Search "Physical Activity Scale for the Elderly" AND #15 | 190 |
| #42 | Search "Godin Leisure Time Exercise Questionnaire" AND #15 | 0 |
| #41 | Search "International Physical Activity Questionnaire" AND #15 | 0 |
| #40 | Search "The Seven-Day Physical Activity Recall" AND #15 | 0 |

Performance tests: (no hits)

| | | |
|---|---|---|
| #55 | Search "Sit to stand x 5" AND #15 | 0 |
| #54 | Search "modified Canadian Aerobic Fitness Test" AND #15 | 0 |
| #53 | Search "modified Canadian Aerobic Fitness Test (mCAFT)" AND | 0 |

| | | |
|---|---|---|
| | #15 | |
| #52 | Search "modified shuttle test" AND #15 | 2 |
| #51 | Search "Rockport 1-mile walk test" AND #15 | 0 |
| #50 | Search "6 minute walk" AND #15 | 18 |
| #49 | Search "12 minute walk" AND #15 | 1 |
| #48 | Search "2 minute stairclimb" AND #15 | 0 |
| #47 | Search "2 minute stairclimb" AND #15 AND cancer | 0 |
| #46 | Search "12 minute walk" AND #15 AND cancer | 0 |
| #45 | Search "6 minute walk" AND #15 AND cancer | 0 |

Slaap: (no hits)

| | | |
|---|---|---|
| #57 | Search "Epworth Sleepiness Scale " AND #15 | 10 |
| #56 | Search "Pittsburgh Sleep Quality Index" AND #15 | 2 |

**Question 10: How can the empowerment of the (ex-)patient be increased (autonomy, contact with fellow patients) so that cancer rehabilitation is possible?**

A search was performed in Medline (updated to 24062009) on 25 June at the CBO in the presence of the development group members H.W. van den Borne and J.F.A. Pruyn via the interface OVID. The search in Embase (also via OVID; updated to week 25 2009), psycINFO (via OVID, updated to 20090601) and CINAHL (via Ebsco host, updated to 20090619) was performed by the information specialist on 26 June 2009 in line with the same search strategy and in the absence of guideline development group members.

The research question was adjusted as follows prior to conducting the search:
*10 a: What are the barriers experienced by the patient in participating in rehabilitation?*
*10 b: What influence does rehabilitation have on the empowerment of the patient?*

This resulted in formulation of the following PICO:
**P** All cancer patients (curative and palliative phase and survivors)
**I** All rehabilitation (see P)
**C**
**O** Empowerment (mention all terms), combined with determinants for non-participation in rehabilitation and terms for participation (for question 10 a) and combined with terms for strengthening/increasing empowerment (for question 10 b).
Search terms were adjusted/added during the search.

For the P, all cancer components are used from the search strategy for *med090421 P cancer rehabilitation version 2* saved in Ovid. The resulting search strategy is:

| P | trefwoorden | operator | woorden in titel (ti) of abstract (ab) |
|---|---|---|---|
| 1 | exp Neoplasms/<br>exp Radiotherapy/<br>Bone Marrow Transplantation/ | OR | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti,ab.<br>(radioth$ or radiat$ or irradiat$ or radiochemo$ or chemotherap$).ti,ab.<br>(bone marrow adj5 transplant$).ti,ab. |
| 2 | Survivors/ | OR | ((disease-free or disease free) adj3 surviv$).tw. |
| 3 | | | ((cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$) adj3 surviv$).tw. |
| 4 | palliative care/<br>exp terminal care/<br>Terminally Ill/ | OR | (palliative adj (treatment$ or care or caring)).ti,ab. |
| 5 | | 4 AND 1 | |
| 6 | | | (advanc$ adj2 (cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$)).tw. |
| 7 | exp treatment outcome/ | OR | (curative adj3 (treatment$ or care or caring)).ti,ab. |

| | | | |
|---|---|---|---|
| 8 | | 9 and 1 | |
| 9 | | | ((cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$) adj3 treat$).tw. |
| 10 | | 2 OR 3 OR 5 OR 6 OR 8 OR 9 | |

For **I** (intervention = types of rehabilitation), the component 'types of rehabilitation' of the search strategy *med090421 P cancer rehabilitation version 2* saved in Ovid is adjusted as follows:

| **I** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | exp Rehabilitation/<br>exp Exercise Therapy/<br>exp Psychotherapy/<br>Meditation/<br>Self-Help Groups/<br>peer group/<br>exp Social Work/ | OR | rehabilitat$.ti,ab.<br>(interval train$ or sport$ or movement therap$).tw.<br>stretch$.tw.<br>(dance adj2 (therap$ or exercis$)).tw.<br>(tai ji or tai chi or tai?ji or tai?chi or walk$ or yoga).tw.<br>(psychosocial adj3 (interven$ or therap$ or train$ or activ$ or exercis$)).tw.<br>((exercise$ or physical$ or resistance or strenght or flexibility or endurance) adj6 (train$ or program$ or interven$ or exercis$)).tw.<br>((resistance or aerobic$ or endurance$) adj3 (exercis$ or train$ or program$ or interven$ or therap$)).tw.<br>(physical$ adj3 (activ$ or therap$ or train$ or exercis$ or interven$ or program$)).tw.<br>psychotherap$.tw.<br>(cognitive adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(relax$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>relaxation.ti,ab.<br>(weight adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>exercise.ti,ab.<br>meditation.ti,ab.<br>(support adj3 group$).ti,ab.<br>(peer adj3 group$).ti,ab.<br>(social adj3 work).ti,ab. |

The search strategy for the **O outcome** (empowerment) is as follows:

| **O** | **trefwoorden** | **operator** | **woorden in titel (ti), abstract (ab) of tekst (tw)** |
|---|---|---|---|
| 1 | "power (psychology)"/<br>exp Self Care/<br>assertiveness/ | OR | (patient$ adj6 empower$).ti,ab.<br>(self-management or selfmanagement or self-regulation or selfregulation or self-efficacy or selfefficacy).ti,ab.<br>(self adj1 (management or efficacy or regulation)).ti,ab.<br>(patient adj3 control).ti,ab.<br>(self-advocacy or selfadvocacy or self-determination or selfdetermination).ti,ab. |
| | | | (self adj1 (advocacy or determination)).ti,ab.<br>(perceived adj2 control).ti,ab.<br>patient autonomy.ti,ab.<br>(selfcare or self-care or self care).ti,ab.<br>((chang$ or adapt$) adj3 (lifestyle or life-style or life style)).ti,ab.<br>(assertiv$ adj3 patient$).ti,ab. |

The search strategy for **D** (determinants for non-participation) is as follows:

| **S** | **trefwoorden** | **operator** | **woorden in titel (ti) of abstract (ab)** |
|---|---|---|---|
| 1 | exp attitude/ or health behavior/ or illness behavior/ or motivation/<br>exp Professional-Patient Relations/ | OR | ((knowledge or aware$) adj3 rehabilitation).ti,ab.<br>(attitude or ((health or illness) adj3 behavio?r) |

| | | | |
|---|---|---|---|
| | Social Values/ | | or motivation).ti,ab.<br>(coping adj3 (strateg$ or process)).ti,ab.<br>(physician adj3 (communication or relation)).ti,ab.<br>(self-efficacy or selfefficacy or self efficacy).ti,ab.<br>barrier$.ti,ab.<br>(social adj2 (value$ or norm$)).ti,ab.<br>obstacle$.ti,ab. |

The search strategy for **C** chronic disease is as follows:

| S | trefwoorden | operator | woorden in titel (ti) of abstract (ab) |
|---|---|---|---|
| 1 | Chronic Disease/ | OR | (chronic adj3 (ill$ or disease$)).ti,ab. |

The search strategy for **A** (participation) is as follows:

| S | trefwoorden | operator | woorden in titel (ti) of abstract (ab) |
|---|---|---|---|
| 1 | | OR | (participat$ or enhanc$ or adherence or beneficial$).ti,ab.<br>(promot$ or improv$ or effect$).ti,ab. |

The search strategy for (strengthening/increasing empowerment and the result) is as follows (these terms are partly derived from the search strategies from questions 4, 5 and 6 for cancer rehabilitation):

| S | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | "Quality of Life"/ | OR | ((prevent$ or reduc$ or declin$ or less or protect$ or few$ or alleviat$ or improve$ or manag$) adj5 symptom$).ti,ab.<br>quality of life.ti,ab.<br>(symptom$ adj5 burden).ti,ab.<br>((psychosocial or psychological or physical) adj3 function$).tw. |

The following search strategy (**Z**) has been used in order to limit the number of hits and make it more specific for cancer:

| S | trefwoorden | operator | woorden in titel (ti) |
|---|---|---|---|
| 1 | | | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti. |

The search strategy for the filter for systematic reviews and meta-analyses *med071129systrev* is as follows:

| F(sysrev) | trefwoorden | operator | woorden in affiliatie (af), publicatietype (pt) of tekst (tw) |
|---|---|---|---|
| 1 | | OR | meta analysis.pt.<br>meta-anal*.af.<br>metaanal*.af.<br>(quantitativ* adj10 review*).tw.<br>(quantitativ* adj10 overview*).tw.<br>(systematic* adj10 review*).tw.<br>(systematic* adj10 overview*).tw.<br>(methodologic* adj10 review*).tw.<br>(methodologic* adj10 overview*).tw.<br>medline.tw. and review-.pt.<br>(pooled adj3 analy*).tw. |

**Results of this search** (all articles are saved in Reference Manager file 'Oncologische revalidatie - vraag 10', with the file name as keyword):

| database | aantal treffers | bestandsnaam |
|---|---|---|
| **combinatie: I AND O AND D AND C AND F(sysrev)** | | |
| Medline | 24 | med090625 chronic ill sysrev |
| Embase | 23 | emb090626 chronic ill sysrev |
| PsycINFO | 19 | psy090626 chronic ill sysrev |
| CINAHL | 10 | cin090626 chronic ill sysrev |

| | | |
|---|---|---|
| **combinatie: P AND I AND O AND D AND A** | | |
| Medline | 249 | med090625 determinanten deelname kankerrevalidatie |
| Embase | 265 | emb090626 determinanten deelname kankerrevalidatie |
| PsycINFO | 74 | psy090626 determinanten deelname kankerrevalidatie |
| CINAHL | 35 | cin090626 determinanten deelname kankerrevalidatie |
| **combinatie: P AND I AND O AND V AND Z** | | |
| Medline | 263 | med090625 effect kankerrevalidatie op empowerment |
| Embase | 242 | emb090626 effect kankerrevalidatie op empowerment |
| PsycINFO | 38 | psy090626 effect kankerrevalidatie op empowerment |
| CINAHL | 53 | cin090626 effect kankerrevalidatie op empowerment |
| **combinatie: P AND I AND O AND V AND F(sysrev)** | | |
| Medline | 26 | med090625 effect kankerrevalidatie op empowerment sysrev |
| Embase | 48 | embd090626 effect kankerrevalidatie op empowerment sysrev |
| PsycINFO | 2 | psy090626 effect kankerrevalidatie op empowerment sysrev |
| CINAHL | 4 | cin090626 effect kankerrevalidatie op empowerment sysrev |

Limitations: no articles that are exclusively about animals, only articles in the Dutch, English or German language, no articles about children to 18 years of age (the last limit does not apply to CINAHL because the limit is unreliable here), and only articles from 1999 through to 2009.

*13. Evidence tables*
For the complete list of evidence tables click here.

You can also find the evidence tables in the chapters.

*16. Houderschap richtlijn*
Voorwaarden voor revisie en beoordelingsfrequentie zijn vastgelegd in de richtlijn. De geldigheidstermijn voor de richtlijn (maximaal 5 jaar na vaststelling) wordt vanuit het Integraal Kankercentrum Nederland bewaakt. Om verscheidene redenen kan actualisatie eerder dan beoogd nodig zijn. Zo nodig zal de richtlijn tussentijds op onderdelen worden bijgesteld.

*17. Juridische betekenis*
De richtlijn bevat aanbevelingen van algemene aard. Het is mogelijk dat deze aanbevelingen in een individueel geval niet van toepassing zijn. Er kunnen zich feiten of omstandigheden voordoen waardoor het wenselijk is dat in het belang van de patiënt van de richtlijn wordt afgeweken. Wanneer van de richtlijn wordt afgeweken, dient dit beargumenteerd gedocumenteerd te worden. De toepasbaarheid en de toepassing van de richtlijnen in de praktijk is de verantwoordelijkheid van de behandelende arts.

*18. Verantwoording*
Het Integraal Kankercentrum Nederland (IKNL) bevordert dat mensen met kanker en hun naasten zo dicht mogelijk bij huis toegang hebben tot een samenhangend en kwalitatief verantwoord zorgaanbod. Het IKNL is opgericht om behandeling, zorg en klinisch onderzoek binnen de oncologie te verbeteren. Daarnaast heeft het IKNL een taak in het opzetten en ondersteunen van netwerken voor palliatieve zorg.

Het IKNL werkt landelijk aan multidisciplinaire richtlijnontwikkeling voor de oncologische en palliatieve zorg. Naast deze ontwikkeling van richtlijnen faciliteert het IKNL ook het onderhoud, het beheer, de implementatie en de evaluatie van deze richtlijnen.

De leidraad voor de ontwikkeling van de richtlijnen voor oncologische en palliatieve zorg is het AGREE instrument. Dit instrument is gemaakt voor de beoordeling van bestaande, nieuwe en herziene richtlijnen. Het AGREE Instrument beoordeelt zowel de kwaliteit van de verslaglegging als de kwaliteit van bepaalde aspecten van de aanbevelingen. Het beoordeelt de kans dat een richtlijn zijn gewenste doel zal behalen, maar niet de daadwerkelijke impact op patiëntuitkomsten.

Het AGREE Instrument is opgebouwd uit 23 items verdeeld over zes domeinen. Elk domein beslaat een aparte dimensie van kwaliteit van richtlijnen, namelijk:

- **Onderwerp en doel** betreft het doel van de richtlijn, de specifieke klinische vragen waarop de richtlijn een antwoord geeft en de patiëntenpopulatie waarop de richtlijn van toepassing is.

- **Betrokkenheid van belanghebbenden** richt zich op de mate waarin de richtlijn de opvattingen van de beoogde gebruikers weerspiegelt.
- **Methodologie** hangt samen met het proces waarin bewijsmateriaal is verzameld en samengesteld en met de gebruikte methoden om aanbevelingen op te stellen en te herzien.
- **Helderheid en presentatie** gaat over het taalgebruik en de vorm van de richtlijn.
- **Toepassing** houdt verband met de mogelijke organisatorische, gedragsmatige en financiële consequenties van het toepassen van de richtlijn.
- **Onafhankelijkheid van de opstellers** betreft de onafhankelijkheid van de aanbevelingen en erkenning van mogelijke conflicterende belangen van leden van de werkgroep.

*19. Implementation and evaluation*

Bij het ontwikkelen van de richtlijnen wordt rekening gehouden met de uitvoerbaarheid van de richtlijn. Daarbij wordt gelet op bevorderende of belemmerende factoren. Om het gebruik in de dagelijkse praktijk te bevorderen wordt in principe een samenvattingkaart gemaakt. Daarnaast wordt de richtlijn gepubliceerd op Oncoline en/of Pallialine (de websites van het IKNL). Tevens wordt de richtlijn verspreid onder de professionals via de (wetenschappelijke) verenigingen en de regiokantoren van het IKNL. In principe worden tijdens het ontwikkelen van de richtlijn indicatoren voor de evaluatie van de aanbevelingen in de richtlijn opgesteld. Middels een documentatieproject kan met behulp van deze indicatoren worden vastgesteld in hoeverre de richtlijn wordt nageleefd. De informatie uit het documentatieproject vormt input bij de revisie van richtlijn.

Voor implementatie van de richtlijn ‘Oncologische revalidatie' is het streven om in aanvulling op de reguliere activiteiten van het IKNL, zoals hierboven beschreven, additionele implementatiestrategieën in te zetten. Een interactieve e-learning module voor professionals en een folder voor patiënten met kanker zullen worden ontwikkeld.

In oktober 2010 is tevens een projectgroep gestart die als doel heeft de aanbevelingen uit de richtlijn ‘Oncologische revalidatie' in de Nederlandse zorg in te bedden, zodat oncologische revalidatiezorg volgens de richtlijn op maat en voor meer (ex-)patiënten met kanker toegankelijk wordt.
De implementatiestrategie voor de richtlijn behelst zowel netwerkvorming als kennisspreiding. Voor deze implementatie worden op twee manieren ondersteunende netwerken ingericht, te weten:

1. Door in samenwerking met oncologen en revalidatie-instellingen/revalidatiegeneeskunde afdelingen van ziekenhuizen een infrastructuur van ketenzorg voor oncologische revalidatiezorg op maat op te zetten, en
2. Door een kennisnetwerk van knowledge brokers te initiëren en te ondersteunen voor de zorginhoudelijke vertaling van de aanbevelingen naar de praktijk.

Daarbij is het doel de effecten van deze innovaties te monitoren aan de hand van nog op te stellen proces- en uitkomstindicatoren. De netwerken van Herstel en Balans, het IKNL en Revalidatie Nederland bieden een sterke basis voor de implementatie van de richtlijn.

*21. Lijst met afkortingen*

| | |
|---|---|
| 1-RM | 1 Repetitie Maximum |
| 7-Day PAR | Zeven Day Physical Activity Recall |
| ACSM | American College of Sports Medicine |
| ADL | Algemene Dagelijkse Levensverrichtingen |
| AE | Aerobic Exercises |
| AGORA | Ondersteuningspunt palliatieve zorg |
| AGREE | Appraisal of Guidelines for REsearch & Evaluation |
| AUC | Area Under the Curve |
| BDI | Beck Depression Inventory |
| BES | Body Esteem Scale |
| BMI | Body Mass Index |
| BFI | Brief Fatigue Inventory |
| BFS | Bidimensional Fatigue Scale |
| CAU | Care As Usual |
| CBO | Kwaliteitsinstituut voor de gezondheidszorg CBO |

| | |
|---|---|
| CBT | Cognitive Behavioural Therapy |
| CCT | Clinical Controled Trial |
| CES-D | Center for Epidemiologic Studies Depression Scale |
| CHAMPS | Community Health Activities Model Program for Seniors Physical Activity Questionnaire |
| CI | Confidence Interval |
| CIS | Checklist Individuele Spankracht |
| CVZ | College Voor Zorgverzekeringen |
| CVZ | Cardio Vasculaire Ziekten |
| DFS | Disease Free Survival |
| ECG | Electro CardioGram |
| EMDR | Eye Movement Desensitization and Reprocessing |
| EN | Ergotherapie Nederland |
| EORTC-QLQ C30 | European Organization for Research and Treatment of Cancer Quality of Life Questionaire C30 |
| ESS | Epworth Sleepiness Scale |
| EWB | Emotional Well-Being |
| FACIT-An | Functional Assessment of Cancer Ilness Therapy-Anemia |
| FACIT-F | Functional Assessment of Cancer Ilness Therapy-Fatigue |
| FACT-An | Functional Assessment of Cancer Therapy-Anemia |
| FACT-B | Functional Assessment of Cancer Therapy-Breast |
| FACT-F | Functional Assessment of Cancer Therapy-Fatigue |
| FACT-G | Functional Assessment of Cancer Therapy-General Scale |
| FQ | Fatigue Questionnaire |
| FSI | Fatigue Symptom Inventory |
| FSS | Fatigue Severity Scale |
| FWB | Functional Well-Being |
| GKVL | Gezondheidsgerelateerde Kwaliteit Van Leven |
| GR | Gezondheids Raad |
| HADS | Hospital Anxiety and Depression Scales |
| Hb | Hemoglobine B |
| HRmax | Maximale hartslag |
| ICC | Intraclass Correlatie Coëfficiënt |
| ICD-10 | International Classification of Diseases 10 |
| ICF | International Classification of Functioning, Disability and Health |
| IKNL | Integraal Kankercentrum Nederland |
| IPAQ | International Physical Activity Questionnaire |
| IPSO | Instellingen PsychoSociale Oncologie |
| KGV | Kanker Gerelateerde Vermoeidheid |
| KNGF | Koninklijk Nederlandse Genootschap Fysiotherapie |
| LASA | Linear Analog Assesment System |
| mCAFT | Modified Canadian Aerobic Fitness Test |
| MCS | Mental Component Summary (SF-36) |
| MD | Mean Difference |
| MDC | Minimal Detectable Change |
| MesH | Medical Subject Headings |
| METS | METabolic equivalents |
| MFI | Multidimensional Fatigue Inventory |
| MIC | Minimally Important Change |
| MID | Minimally Important Difference |
| MLTQ | Minnesota Leisure Time Questionnaire |
| MVI | Multidimensionele Vermoeidheids Index |
| NFK | Nederlandse Federatie van Kankerpatiëntenorganisaties |
| NHG | Nederlands Huisartsen Genootschap |
| NIP | Nederlands Instituut voor Psychologen |

| | |
|---|---|
| NKR | Nederlandse Kankerregistratie |
| NVAB | Nederlandse Vereniging voor Arbeids- en Bedrijfsgeneeskunde |
| NVCO | Nederlandse Vereniging voor Chirurgische Oncologie |
| NVFL | Nederlandse Vereniging voor Fysiotherapie binnen de Lymfologie |
| NVMO | Nederlandse Vereniging voor Medische Oncologie |
| NVPO | Nederlandse Vereniging voor Psychosociale Oncologie |
| NVVC | Nederlandse Vereniging voor Cardiologie |
| NVVG | Nederlandse Vereniging voor Verzekeringsgeneeskunde |
| NVvH | Nederlandse Vereniging voor Heelkunde |
| NVRO | Nederlandse Vereniging voor Radiotherapie en Oncologie |
| OIFS | One-Item Fatigue Scale |
| OR | Odds Ratio |
| PA | Physical Activity |
| PACT | Physical Activity during Cancer Treatment |
| PANAS | Positive Affect Negative Affect Scale |
| PASE | Physical Activity Scale for the Elderly |
| PCS | Physical Component Summary (SF-36) |
| PICO | Patient Intervention Comparison Outcome |
| PILE | Progressive Isoinertial Lifting Evaluation |
| POMS | Profile Of Moods State |
| PRE | Progressive Resistance Training |
| PS | Placebo Stretching |
| PSK | Patiënt Specifieke Klachtenlijst |
| PSQI | Pittsburgh Sleep Quality Index |
| PTSS | Post Traumatic Stress Syndrome |
| PWB | Physical Well-Being |
| QAPSE | Questionnaire d'Activité Physique Saint-Etienne |
| QOL | Quality Of Life |
| RAND-36 | Kwaliteit van leven vragenlijst RAND-36 item health survey |
| RCT | Randomised Controlled Trial |
| RE-AIM | Reach, Efficacy/effectiveness, Adoption, Implementation, Maintainance |
| RN | Revalidatie Nederland |
| ROC | Receiver Operating Characteristic |
| ROM | Range Of Motion |
| RSCL | Rotterdam Symptom Check List |
| RSE | Rosenberg Self Esteem Scale |
| SAPAQ | 7-day Physical Activity Questionnaire |
| SCFS | Schwartz Cancer Fatigue Scale |
| SCL-90 | Symptom Check List 90 |
| SD | Standard Deviation |
| SDS | Symptom Distress Scale |
| SE | Standard Error |
| SEM | Standard Error of Measurement |
| SF-36 | Medical Outcomes Study Form Short Form 36 |
| SMD | Standardized Mean Differences |
| SPAS-7 | Social Physique Anxiety Scale |
| SPAQ | Scottish Physical Activity Questionnaire |
| STAI | State Trait Anxiety Inventory |
| SVL | Schok Verwerkings Lijst |
| SWB | Social Well-Being |
| SWLS | Satisfaction With Life Scale |
| SWT | Shuttle Walk Test |
| TCHS | Tecumseh Community Health Study |
| VAS | Visueel Analoge Schaal |

| | |
|---|---|
| VIKC | Vereniging van Integrale Kanker Centra |
| $VO_{2max}$ | Maximale zuurstof opname |
| $VO_{2peak}$ | Hoogst meetbare zuurstof opname |
| VRA | Nederlandse Vereniging voor Revalidatieartsen |
| V&VN | Verpleegkundigen en Verzorgenden Nederland Oncologie |
| VSG | Vereniging voor Sportgeneeskunde |
| WHO | World Health Organisation |
| WHOQOL-BREF | World Health Organisation Quality of Life - abbreviated |
| WIA | Wet Werk en Inkomen naar Arbeidsvermogen |
| WMD | Weighted Mean Differences |
| WVP | Wet Verbetering Poortwachter |
| ZonMw | Nederlandse organisatie voor gezondheidsonderzoek en zorginnovatie |
| ZSDS | Zung Self Rating Depression Scale |

*22. Goals of specialised medical rehabilitation in oncology*

**Table 1. Goals of specialised medical rehabilitation in oncology**

**During treatment with curative intent**

Physical goals

- Stabilising/improving physical condition and level of activity
- Prevention or reduction of symptoms of fatigue

Optimising/sustaining desired nutritional status

Psychological/Social goals

- Achieving a new emotional balance
- Functional management of the disease and limitations (optimising coping)
- Functioning optimally in employment/household tasks
- Fulfilling a role in family/social relationships as optimally as possible
- Filling leisure time as optimally as possible
- Learning how to cope with new perspectives (existential coping)

**After treatment with curative intent**

Physical goals

- Stabilising/improving physical condition and level of activity
- Learning to manage physical boundaries and limitations
- Stimulating and maintaining an active lifestyle

Optimising/sustaining desired nutritional status

Psychological/Social goals

- Achieving a new emotional balance
- Functional management of the disease and limitations (optimising coping)
- Functioning optimally in employment/household tasks
- Optimal resumption of a role in family/social relationships
- Optimal resumption of leisure time activities
- Gaining insight and getting to grips with factors that maintain or worsen symptoms such as fatigue
- Functional management of available energy
- Learning how to cope with new perspectives (existential coping)

**Palliative phase (disease- and symptom-oriented)**

Physical goals

- Sustaining/optimising physical functioning and associated quality of life
- Learning to manage physical limitations

- Optimising/sustaining desired nutritional status

Psychological/Social goals

- Gaining insight and getting to grips with factors that maintain or worsen symptoms such as fatigue
- Functional management of available energy

Learning how to cope with new perspectives (existential coping)

Professionals can stimulate patients to participate in rehabilitation in a number of ways. Peer advisors and the patient's family and friends can be involved in optimising support for the patient.

*23. Literature search intake*
**Zoekverantwoording Intake**

**Methodology report**
**Vraag 8: Waar moet de intake uit bestaan om te bepalen welke vorm van revalidatie het meest geschikt is voor die specifieke patiënt?**

Met de eerder gebruikte zoekvraag werd via Ovid gezocht in Medline naar literatuur m.b.t. vraag 8. Er werd gezocht naar artikelen gepubliceerd in 2009 t/m 1 juni 2015.

De zoekvraag werd als volgt opgebouwd:

**PICO**
**P** Alle soorten oncologische revalidatie (zie P: let op onderscheid curatieve en palliatieve fase) Problemen van patiënten met kanker (verschillende per fase): rijtje G. Schep
**I** Intake op fysieke en psychosociale problematiek
**C**
**O** Minste uitval, beste effecten (van revalidatie)

**Pp, kanker en patiënten in alle kankerfasen** (curatief, palliatief, overlevenden)

| Pp | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | exp Neoplasms/<br>exp Radiotherapy/<br>Bone Marrow Transplantation/ | OR | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti,ab.<br>(radioth$ or radiat$ or irradiat$ or radiochemo$ or chemotherap$).ti,ab.<br>(bone marrow adj5 transplant$).ti,ab. |
| 2 | Survivors/ | OR | ((disease-free or disease free) adj3 surviv$).tw. |
| 3 | | 1 AND 2 | |
| 4 | | | ((cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$) adj3 surviv$).tw. |
| 5 | | 3 OR 4 | |
| 6 | palliative care/ or exp terminal care/<br>Terminally Ill/ | OR | (palliative adj (treatment$ or care or caring)).ti,ab. |
| 7 | | 1 AND 6 | |
| 8 | | | (advanc$ adj2 (cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$)).tw. |
| 9 | | 7 OR 8 | |
| 10 | exp treatment outcome/ | OR | (curative adj3 (treatment$ or care or caring)).ti,ab. |
| 11 | | 1 AND 10 | |

| | | |
|---|---|---|
| 12 | | ((cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$) adj3 treat$).tw. |
| 13* | 11 or 12 | |
| 14* | 1 OR 5 OR 9 OR 13 | |

*Aangepast t.o.v. de vorige keer

**Pr, soorten revalidatie**

| Pr | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | exp Rehabilitation/<br>exp Exercise Therapy/<br>exp Psychotherapy/<br>Meditation/ | OR | rehabilitat$.ti,ab.<br>(interval train$ or sport$ or movement therap$).tw.<br>stretch$.tw<br>(dance adj2 (therap$ or exercis$)).tw.<br>(tai ji or tai chi or tai?ji or tai?chi or walk$ or yoga).tw.<br>(psychosocial adj3 (interven$ or therap$ or train$ or activ$ or exercis$)).tw.<br>((exercise$ or physical$ or resistance or strenght or flexibility or endurance) adj6 (train$ or program$ or interven$ or exercis$)).tw.<br>((resistance or aerobic$ or endurance$) adj3 (exercis$ or train$ or program$ or interven$ or therap$)).tw.<br>(physical$ adj3 (activ$ or therap$ or train$ or exercis$ or interven$ or program$)).tw.<br>psychotherap$.tw.<br>(behavio?r$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(cognitive adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(relax$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>relaxation.ti,ab.<br>(weight adj3 (train$ or program$ or exercis$ or interven$ or therap$ or activ$)).tw.<br>exercise.ti,ab.<br>mindfulness.tw.<br>meditation.ti,ab.<br>((person or client) adj3 (intervention or therap$ or treatment or program$)).ti,ab. |

**Filter voor systematic reviews en meta-analyses**

| Fsysrev | trefwoorden | operator | woorden in affiliatie (af), publicatietype (pt) of tekst (tw) |
|---|---|---|---|
| 1 | | OR | meta analysis.pt.<br>meta-anal*.af.<br>metaanal*.af.<br>(quantitativ* adj10 review*).tw.<br>(quantitativ* adj10 overview*).tw.<br>(systematic* adj10 review*).tw.<br>(systematic* adj10 overview*).tw.<br>(methodologic* adj10 review*).tw.<br>(methodologic* adj10 overview*).tw.<br>medline.tw. and review-.pt.<br>(pooled adj3 analy*).tw. |

**If interventie, d.i. functionele testen** (voor fysieke onderdeel van de vraag)

| If | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | Exercise Test/<br>exp Respiratory Function Tests/<br>Oxygen Consumption/ | OR | (exercise adj3 (test$ or measur$ or evaluat$ or physolo$ or assessment)).ti,ab.<br>(respirator$ adj5 (test$ or measur$ or evaluat$ or assessment)).ti,ab.<br>(cardiorespirator$ adj5 (test$ or measur$ or evaluat$ or assessment)).ti,ab. |

| | | | |
|---|---|---|---|
| | exp Muscle Strength/ Cachexia/ Lymphedema/ | | (oxygen adj3 (consumption or uptake)).ti,ab.<br>(muscle adj3 strength adj3 (test$ or measur$ or evaluat$ or assessment)).ti,ab.<br>((weight or muscle) adj3 loss).ti,ab.<br>((neuromuscular or neuropath$ or paresthes$) adj3 (test$ or measur$ or evaluat$ or assessment or scale)).ti,ab.<br>(lymph?edema or (shoulder adj3 (problem$ or pain or dysfunction$ or function) adj3 (test$ or measur$ or evaluat$ or assessment or scale))).ti,ab. |

**Ip interventie, d.i. functionele testen** (voor psychosociale onderdeel van de vraag)

| Ip | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | Questionnaires/ "Quality of Life"/ | OR | ((psychological or psychosocial or social) adj3 (test$ or measur$ or evaluat$ or assessment or scale)).ti,ab.<br>((depression or anxiety or fear or self-efficacy or selfefficacy or self-esteem or selfesteem or distress or mental stress or cognitive or fatigue) adj5 (test$ or measur$ or evaluat$ or assessment or scale)).ti,ab.<br>(coping or mental adjustment or competence or social support or motivation).ti,ab.<br>quality of life.ti,ab.<br>((sexual or relation$) adj3 problem$).tw. |

**S, psychosociale schalen**

| S | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | | OR | (responses adj3 stress questionnaire$).ti,ab.<br>mental adjustment to cancer scale.tw.<br>(basic documentation adj3 (psycho-oncology or psychooncology)).tw.<br>distress thermometer.tw.<br>(hospital anxiety and depression scale).tw.<br>patient questionnaire for assessment of rehabilitation motivation.tw. |

**O, outcome d.w.z. het voorkomen/verbeteren van klachten en de beste effecten van de revalidatie**

| O | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | Patient Satisfaction/' "Quality of Life"/ "Activities of Daily Living"/ | OR | (satisfact$ adj4 (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$) adj4 patient$).ti,ab<br>quality of life.ti,ab.<br>((less or few$ or reduc$ or diminish$) adj3 (complain$ or pain or fatigue)).ti,ab.<br>((improv$ or better or enhanc$) adj3 (function$ or perform$ or abilit$ or able)).ti,ab. |

De opbrengst is ingeperkt met deze zoekstrategie:

| G | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | | | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$ or exercise or program$ or rehabilitat$).ti. |

Limiteringen: geen artikelen uitsluitend over dieren, alleen artikelen in de Nederlandse, Engelse of Duitse taal, artikelen over kinderen (tot 18 jaar) uitgesloten en alleen artikelen vanaf 2009 tot en met 2015.

**Resultaten van deze search, t.o.v. de vorige search.** (Alle artikelen zijn opgeslagen in Endnote-bestand ‘RL Onc Rev-2.enl.)
Er werden ten opzichte van de vorige keer ongeveer twee keer zoveel referenties gevonden, namelijk in totaal 778 artikelen. Na ontdubbeling bleven er 751 artikelen over.

| database | bijgewerkt tot: | aantal treffers |
|---|---|---|
| Medline | 28 augustus 2009 | 227 |
| Medline | 1 juni 2015 | 383 |

| | | |
|---|---|---|
| Medline | 28 augustus 2009 | 18 |
| Medline | 1 juni 2015 | 36 |
| Medline | 28 augustus 2009 | 110 |
| Medline | 1 juni 2015 | 223 |
| Medline | 28 augustus2009 | 80 |
| Medline | 1 juni 2015 | 134 |

Van deze 751 artikelen werd op basis van titel en abstract bekeken in hoeverre zij de vraag konden beantwoorden, volgens de PICO.

Artikelen werden geëxcludeerd wegens:

- Geen intake onderzocht (veruit de meesten)
- Kinderen als doelgroep
- Case studie
- Ander onderwerp (bijvoorbeeld geriatric assessment)

Uit deze selectie op titel en abstract bleven 3 potentieel relevante artikelen over (zie de onderstaande tabel). Op de full tekst van deze artikelen werd verder beoordeeld in hoeverre zij de vraag konden beantwoorden, volgens de PICO. Alle drie de artikelen vielen vervolgens af.

**Tabel 1: Beoordeling op full tekst.**

| Auteur | Titel | Tijdschrift | Inclusie/exclusie | Reden van exclusie |
|---|---|---|---|---|
| Smith EM, Bakitas MA, Homel P, Piehl M, Kingman L, Fadul CE, Bookbinder M. | Preliminary assessment of a neuropathic pain treatment and referral algorithm for patients with cancer. | J Pain Symptom Manage. 2011 | Ex | Gaat alleen over behandeling van neuropathie. |
| Hutchison NA | Cancer rehabilitation | Minn Med. 2010 | Ex | Geen intake onderzocht |
| Stubblefield MD | Cancer rehabilitation | Semin Oncol. 2011 | Ex | Geen intake onderzocht |

*24. Evidence tables intake*

**3. Evidence Report Intake**

Om zicht te krijgen op wat een intake dient te omvatten, is systematisch gezocht in de literatuur met steekwoorden als oncologische revalidatie, problemen van patiënten met kanker, intake op fysieke en psychosociale problematiek, minste uitval of beste effecten van revalidatie (zie methodology report hieronder). Dit resulteerde in een uitgebreide database: namelijk in totaal 778 artikelen. Na ontdubbeling bleven er 751 artikelen over. De verkregen literatuur is beoordeeld, waarbij reviews of originele artikelen met als onderwerp kanker en informatie over inspanningstolerantie en/of beperkende (fysieke of psychosociale) factoren als potentieel relevant geclassificeerd werden. Studies waarbij uit het abstract evident werd dat ze geen relevante informatie over de intake verschaften of die methodologisch onvoldoende waren (case reports) of die over een ander onderwerp gingen of die kinderen als doelgroep hadden vielen af. Na deze selectie bleven 3 potentieel relevante artikelen over. Deze artikelen werden op

full tekst verder beoordeeld en vielen vervolgens alsnog af, omdat er geen vorm van intake werd onderzocht (2 studies) of omdat het ging over de behandeling van neuropathie.

**Methodology report**
**Waar moet de intake uit bestaan om te bepalen welke vorm van revalidatie het meest geschikt is voor die specifieke patiënt?**

Met de eerder gebruikte zoekvraag werd via Ovid gezocht in Medline naar literatuur m.b.t. vraag 8. Er werd gezocht naar artikelen gepubliceerd in 2009 t/m 1 juni 2015.

De zoekvraag werd als volgt opgebouwd:

**PICO**
**P** Alle soorten oncologische revalidatie (zie P: let op onderscheid curatieve en palliatieve fase) Problemen van patiënten met kanker (verschillende per fase): rijtje G. Schep
**I** Intake op fysieke en psychosociale problematiek
**C**
**O** Minste uitval, beste effecten (van revalidatie)

**Pp, kanker en patiënten in alle kankerfasen** (curatief, palliatief, overlevenden)

| Pp | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | exp Neoplasms/<br>exp Radiotherapy/<br>Bone Marrow Transplantation/ | OR | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$).ti,ab.<br>(radioth$ or radiat$ or irradiat$ or radiochemo$ or chemotherap$).ti,ab.<br>(bone marrow adj5 transplant$).ti,ab. |
| 2 | Survivors/ | OR | ((disease-free or disease free) adj3 surviv$).tw. |
| 3 | | 1 AND 2 | |
| 4 | | | ((cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$) adj3 surviv$).tw. |
| 5 | | 3 OR 4 | |
| 6 | palliative care/ or exp terminal care/<br>Terminally Ill/ | OR | (palliative adj (treatment$ or care or caring)).ti,ab. |
| 7 | | 1 AND 6 | |
| 8 | | | (advanc$ adj2 (cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$)).tw. |
| 9 | | 7 OR 8 | |
| 10 | exp treatment outcome/ | OR | (curative adj3 (treatment$ or care or caring)).ti,ab. |
| 11 | | 1 AND 10 | |
| 12 | | | ((cancer or tumo?r or neoplasm$ or carcino$ or leuk?emi$ or sarcoma$ or adenocarcino$ or lymphom$ or oncolog$) adj3 treat$).tw. |
| 13* | | 11 or 12 | |
| 14* | | 1 OR 5 OR 9 OR 13 | |

*Aangepast t.o.v. de vorige keer

**Pr, soorten revalidatie**

| Pr | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | exp Rehabilitation/<br>exp Exercise Therapy/ | OR | rehabilitat$.ti,ab.<br>(interval train$ or sport$ or movement therap$).tw. |

| | | | |
|---|---|---|---|
| | exp Psychotherapy/<br>Meditation/ | | stretch$.tw<br>(dance adj2 (therap$ or exercis$)).tw.<br>(tai ji or tai chi or tai?ji or tai?chi or walk$ or yoga).tw.<br>(psychosocial adj3 (interven$ or therap$ or train$ or activ$ or exercis$)).tw.<br>((exercise$ or physical$ or resistance or strenght or flexibility or endurance) adj6 (train$ or program$ or interven$ or exercis$)).tw.<br>((resistance or aerobic$ or endurance$) adj3 (exercis$ or train$ or program$ or interven$ or therap$)).tw.<br>(physical$ adj3 (activ$ or therap$ or train$ or exercis$ or interven$ or program$)).tw.<br>psychotherap$.tw.<br>(behavio?r$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(cognitive adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>(relax$ adj3 (train$ or program$ or exercis$ or interven$ or therap$or activ$)).tw.<br>relaxation.ti,ab.<br>(weight adj3 (train$ or program$ or exercis$ or interven$ or therap$ or activ$)).tw.<br>exercise.ti,ab.<br>mindfulness.tw.<br>meditation.ti,ab.<br>((person or client) adj3 (intervention or therap$ or treatment or program$)).ti,ab. |

**Filter voor systematic reviews en meta-analyses**

| Fsysrev | trefwoorden | operator | woorden in affiliatie (af), publicatietype (pt) of tekst (tw) |
|---|---|---|---|
| 1 | | OR | meta analysis.pt.<br>meta-anal*.af.<br>metaanal*.af.<br>(quantitativ* adj10 review*).tw.<br>(quantitativ* adj10 overview*).tw.<br>(systematic* adj10 review*).tw.<br>(systematic* adj10 overview*).tw.<br>(methodologic* adj10 review*).tw.<br>(methodologic* adj10 overview*).tw.<br>medline.tw. and review-.pt.<br>(pooled adj3 analy*).tw. |

**If interventie, d.i. functionele testen** (voor fysieke onderdeel van de vraag)

| If | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | Exercise Test/<br>exp Respiratory Function Tests/<br>Oxygen Consumption/<br>exp Muscle Strength/<br>Cachexia/<br>Lymphedema/ | OR | (exercise adj3 (test$ or measur$ or evaluat$ or physolo$ or assessment)).ti,ab.<br>(respirator$ adj5 (test$ or measur$ or evaluat$ or assessment)).ti,ab.<br>(cardiorespirator$ adj5 (test$ or measur$ or evaluat$ or assessment)).ti,ab.<br>(oxygen adj3 (consumption or uptake)).ti,ab.<br>(muscle adj3 strength adj3 (test$ or measur$ or evaluat$ or assessment)).ti,ab.<br>((weight or muscle) adj3 loss).ti,ab.<br>((neuromuscular or neuropath$ or paresthes$) adj3 (test$ or measur$ or evaluat$ or assessment or scale)).ti,ab.<br>(lymph?edema or (shoulder adj3 (problem$ or pain or dysfunction$ or function) adj3 (test$ or measur$ or evaluat$ or assessment or scale))).ti,ab. |

**Ip interventie, d.i. functionele testen** (voor psychosociale onderdeel van de vraag)

| Ip | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | | OR | |

| | | |
|---|---|---|
| | Questionnaires/<br>"Quality of Life"/ | ((psychological or psychosocial or social) adj3 (test$ or measur$ or evaluat$ or assessment or scale)).ti,ab.<br>((depression or anxiety or fear or self-efficacy or selfefficacy or self-esteem or selfesteem or distress or mental stress or cognitive or fatigue) adj5 (test$ or measur$ or evaluat$ or assessment or scale)).ti,ab.<br>(coping or mental adjustment or competence or social support or motivation).ti,ab.<br>quality of life.ti,ab.<br>((sexual or relation$) adj3 problem$).tw. |

**S, psychosociale schalen**

| S | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | | OR | (responses adj3 stress questionnaire$).ti,ab.<br>mental adjustment to cancer scale.tw.<br>(basic documentation adj3 (psycho-oncology or psychooncology)).tw.<br>distress thermometer.tw.<br>(hospital anxiety and depression scale).tw.<br>patient questionnaire for assessment of rehabilitation motivation.tw. |

**O, outcome d.w.z. het voorkomen/verbeteren van klachten en de beste effecten van de revalidatie**

| O | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | Patient Satisfaction/'<br>"Quality of Life"/<br>"Activities of Daily Living"/ | OR | (satisfact$ adj4 (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$) adj4 patient$).ti,ab<br>quality of life.ti,ab.<br>((less or few$ or reduc$ or diminish$) adj3 (complain$ or pain or fatigue)).ti,ab.<br>((improv$ or better or enhanc$) adj3 (function$ or perform$ or abilit$ or able)).ti,ab. |

De opbrengst is ingeperkt met deze zoekstrategie:

| G | trefwoorden | operator | woorden in titel (ti), abstract (ab) of tekst (tw) |
|---|---|---|---|
| 1 | | | (cancer$ or tumo?r$ or oncolog$ or neoplasm$ or malignan$ or carcino$ or sarcoma$ or leuk?emi$ or neutropeni$ or adenocarcino$ or lymphom$ or exercise or program$ or rehabilitat$).ti. |

Limiteringen: geen artikelen uitsluitend over dieren, alleen artikelen in de Nederlandse, Engelse of Duitse taal, artikelen over kinderen (tot 18 jaar) uitgesloten en alleen artikelen vanaf 2009 tot en met 2015.

**Resultaten van deze search, t.o.v. de vorige search.** (Alle artikelen zijn opgeslagen in Endnote-bestand 'RL Onc Rev-2.enl.)
Er werden ten opzichte van de vorige keer ongeveer twee keer zoveel referenties gevonden, namelijk in totaal 778 artikelen. Na ontdubbeling bleven er 751 artikelen over.

| database | bijgewerkt tot: | aantal treffers |
|---|---|---|
| Medline | 28 augustus 2009 | 227 |
| Medline | 1 juni 2015 | 383 |
| Medline | 28 augustus 2009 | 18 |
| Medline | 1 juni 2015 | 36 |
| Medline | 28 augustus 2009 | 110 |
| Medline | 1 juni 2015 | 223 |
| Medline | 28 augustus2009 | 80 |
| Medline | 1 juni 2015 | 134 |

Van deze 751 artikelen werd op basis van titel en abstract bekeken in hoeverre zij de vraag konden

beantwoorden, volgens de PICO.

Artikelen werden geëxcludeerd wegens:

- Geen intake onderzocht (veruit de meesten)
- Kinderen als doelgroep
- Case studie
- Ander onderwerp (bijvoorbeeld geriatric assessment)

Uit deze selectie op titel en abstract bleven 3 potentieel relevante artikelen over (zie de onderstaande tabel). Op de full tekst van deze artikelen werd verder beoordeeld in hoeverre zij de vraag konden beantwoorden, volgens de PICO. Alle drie de artikelen vielen vervolgens af.

**Tabel 1: Beoordeling op full tekst.**

| Auteur | Titel | Tijdschrift | Inclusie/exclusie | Reden van exclusie |
|---|---|---|---|---|
| Smith EM, Bakitas MA, Homel P, Piehl M, Kingman L, Fadul CE, Bookbinder M. | Preliminary assessment of a neuropathic pain treatment and referral algorithm for patients with cancer. | J Pain Symptom Manage. 2011 | Ex | Gaat alleen over behandeling van neuropathie. |
| Hutchison NA | Cancer rehabilitation | Minn Med. 2010 | Ex | Geen intake onderzocht |
| Stubblefield MD | Cancer rehabilitation | Semin Oncol. 2011 | Ex | Geen intake onderzocht |

*25. Literature search healthy lifestyle*

# Zoekverantwoording Gezonde leefstijl

# Key question 1

## 1. Key question

*Wat zijn kenmerken voor het zelfstandig oppakken / handhaven van een gezonde leefstijl (fysieke actief, gezond voedingspatroon, niet roken, beperkt alcoholgebruk, gezond lichaamsgewicht) voor patiënten met kanker?*
P: patiënten met kanker
I: persoonlijkheid (bv. controle, self-efficacy, neuroticisme/extraversie/conscientiousness/BIG five end.), huidig gedrag (leeft iemand al gezond/sport iemand al of moet iemand daarmee beginnen), ervaren druk/steun van omgeving, motivatie, planning, sociaal ecomonische status, leeftijd, age , social cognitive theory constructen (self efficacy etc.) theory of planned behavior constructen (intention, value, social support, etc.) klachten en symptomen (pijn, vermoeidheid, neuropathie) bewegingsangst, kennis
C: -
O: gezonde leefstijl (fysieke actief, gezond voedingspatroon, niet roken, beperkt alcoholgebruik, gezond lichaamsgewicht)

## 2. Search strategy

Search date: February 13 and 20, 2014.
Databases: OVID Medline, Embase, Cochrane Library, Cinahl, Pedro (see appendix for search strings).
Search limits:

- Publication date: 2008-2014;
- English and Dutch only;

- Study design: meta-analyses, systematic reviews, cohort studies of at least 100 patients.

## 3. Search Results

**Table 1. Overall search results.**

| **Database** | **Number of hits** |
|---|---|
| OVID Medline | 740 |
| OVID PreMedline | 93 |
| EMBASE.com | 827 |
| Cochrane Database of Systematic Reviews | 6 |
| DARE | 1 |
| HTA database | 0 |
| CENTRAL | 203 |
| Cinahl | 80 |
| Pedro | 156 |
| **Total hits** | **2106** |
| N excluded (language, year, duplicates) | 699 |
| **Total unique eligible hits** | **1407** |

### a. Excluded studies

1407 unique hits were screened on title and abstract (Table 1). Of these, 1313 were excluded. The most important reasons for exclusion were:

1. Other population: patients without cancer
2. Other intervention: interventions other than those specified

3. Wrong study design: narrative reviews, studies with less than 100 patients, etc

Of the remaining 94 papers, the full-text was retrieved. Based on the full-text, an additional 73 papers were excluded. Table 2 provides an overview of these excluded studies.

## b. Included studies

The following 20 primary studies (published in 21 papers) were included:

- Basen-Engquist K, Carmack CL, Li Y, Brown J, Jhingran A, Hughes DC, et al. Social-cognitive theory predictors of exercise behavior in endometrial cancer survivors. Health Psychol. 2013;32(11):1137-48.
- Belanger LJ, Plotnikoff RC, Clark AM, Courneya KS. Determinants of physical activity in young adult cancer survivors. Am J Health Behav. 2012;36(4):483-94.
- Blaney JM, Lowe-Strong A, Rankin-Watt J, Campbell A, Gracey JH. Cancer survivors' exercise barriers, facilitators and preferences in the context of fatigue, quality of life and physical activity participation: a questionnaire-survey. Psychooncology. 2013;22(1):186-94.
- Brunet J, Sabiston CM. Self-presentation and physical activity in breast cancer survivors: the moderating effect of social cognitive constructs. J Sport Exerc Psychol. 2011;33(6):759-78.
- Chipperfield K, Fletcher J, Millar J, Brooker J, Smith R, Frydenberg M, et al. Factors associated with adherence to physical activity guidelines in patients with prostate cancer. Psycho-Oncology. 2013;22(11):2478-86.
- Cox CL, Montgomery M, Oeffinger KC, Leisenring W, Zeltzer L, Whitton JA, et al. Promoting physical activity in childhood cancer survivors: results from the Childhood Cancer Survivor Study. Cancer. 2009;115(3):642-54.
- Gjerset GM, Fossa SD, Courneya KS, Skovlund E, Jacobsen AB, Thorsen L. Interest and preferences for exercise counselling and programming among Norwegian cancer survivors. Eur J Cancer Care (Engl). 2011;20(1):96-105.
- Harrison S, Hayes SC, Newman B. Level of physical activity and characteristics associated with change following breast cancer diagnosis and treatment. Psycho Oncology. 2009;18(4):387-94.
- Hsu H-T, Dodd MJ, Guo S-E, Lee KA, Hwang S-L, Lai Y-H. Predictors of exercise frequency in breast cancer survivors in Taiwan. J Clin Nurs. 2011;20(13-14):1923-35.
- Huy C, Schmidt ME, Vrieling A, Chang-Claude J, Steindorf K. Physical activity in a German breast cancer patient cohort: One-year trends and characteristics associated with change in activity level. Eur. J. Cancer. 2012;48(3):297-304.
- Karvinen KH, Courneya KS, Plotnikoff RC, Spence JC, Venner PM, North S. A prospective study of the determinants of exercise in bladder cancer survivors using the Theory of Planned Behavior. Support Care Cancer. 2009;17(2):171-9.
- McGowan EL, Speed-Andrews AE, Rhodes RE, Blanchard CM, Culos-Reed SN, Friedenreich CM, et al. Sport participation in colorectal cancer survivors: an unexplored approach to promoting physical activity. Support Care Cancer. 2013;21(1):139-47.
- Milne HM, Wallman KE, Guilfoyle A, Gordon S, Corneya KS. Self-determination theory and physical activity among breast cancer survivors. J Sport Exerc Psychol. 2008;30(1):23-38.
- Ng AK, Li S, Recklitis C, Diller LR, Neuberg D, Silver B, et al. Health Practice in Long-Term Survivors of Hodgkin's Lymphoma. Int. J. Radiat. Oncol. Biol. Phys. 2008;71(2):468-76.
- Peddle CJ, Plotnikoff RC, Wild TC, Au H-J, Courneya KS. Medical, demographic, and psychosocial correlates of exercise in colorectal cancer survivors: an application of self-determination theory. Support Care Cancer. 2008;16(1):9-17.
- Soerjomataram I, Thong MSY, Korfage IJ, Polinder S, Van Der Heide A, De Vries E, et al. Excess weight among colorectal cancer survivors: Target for intervention. J. Gastroenterol. 2012;47(9):999-1005.
- Speed-Andrews AE, Rhodes RE, Blanchard CM, Culos-Reed SN, Friedenreich CM, Belanger LJ, et al. Medical, demographic and social cognitive correlates of physical activity in a population-based sample of colorectal cancer survivors. Eur J Cancer Care (Engl). 2012;21(2):187-96.
- Stevinson C, Tonkin K, Capstick V, Schepansky A, Ladha AB, Valance JK, et al. A population-based study of the determinants of physical activity in ovarian cancer survivors. J Phys Act Health. 2009;6(3):339-46.
- Trinh L, Plotnikoff RC, Rhodes RE, North S, Courneya KS. Correlates of physical activity in a population-based sample of kidney cancer survivors: an application of the theory of planned

behavior. International Journal of Behavioral Nutrition & Physical Activity. 2012;9(96).
- Vallance JK, Lavallee C, Culos-Reed NS, Trudeau MG. Predictors of physical activity among rural and small town breast cancer survivors: an application of the theory of planned behaviour. Psychology Health & Medicine. 2012;17(6):685-97.

- Yang H-K, Shin D-W, Park J-H, Kim S-Y, Eom C-S, Kam S, et al. The association between perceived social support and continued smoking in cancer survivors. Jpn J Clin Oncol. 2013;43(1):45-54.

**Table 2. Key question 1: overview of excluded studies based on full-text evaluation.**

| Author | Reference | Title | R |
|---|---|---|---|
| Andersen AH | Support Care Cancer 2013 21(8):2247-53 | A modified exercise protocol may promote continuance of exercise after the intervention in lung cancer patients--a pragmatic uncontrolled trial | G ke |
| Basen-Engquist K | Psychology of Sport and Exercise 2011 12(1):27-35 | Design of the steps to health study of physical activity in survivors of endometrial cancer: Testing a social cognitive theory model | St |
| Blanchard CM | J Clin Oncol 2008 26(13):2198-204 | Cancer survivors' adherence to lifestyle behavior recommendations and associations with health-related quality of life: results from the American Cancer Society's SCS-II | G va Q |
| Blaney J | Phys Ther 2010 90(8):1135-1147 | The cancer rehabilitation journey: barriers to and facilitators of exercise among patients with cancer-related fatigue | N= |
| Bourke L | Cancer Epidemiol. Biomarkers Prev. 2011 20(4):647-657 | Lifestyle intervention in men with advanced prostate cancer receiving androgen suppression therapy: A feasibility study | G ke |
| Bourke L | Br. J. Cancer 2013 | Interventions to improve exercise behaviour in sedentary people living with and beyond cancer: a systematic review | G ke ef op |
| Bourke L | Cochrane Database of Systematic Reviews 2013 9): | Interventions for promoting habitual exercise in people living with and beyond cancer | G ke ef op |
| Bourke L | Arch. Phys. Med. Rehabil. 2011 92(5):749-755 | Pragmatic lifestyle intervention in patients recovering from colon cancer: A randomized controlled pilot study | G ke ef co |
| Browning KK | Cancer Nurs 2009 32(4):E15-25 | The Self-regulation Model of Illness applied to smoking behavior in lung cancer | En tu qu la |
| Brunet J | Disability & Rehabilitation 2013 35(24):2038-45 | A qualitative exploration of barriers and motivators to physical activity participation in women treated for breast cancer | N= |
| Carter CL | Supportive Care Cancer 2012 20(8):1699-1707 | The comparative effectiveness of a team-based versus group-based physical activity intervention for cancer survivors | G ke ef co |
| Courneya KS | Cancer 2008 112(8):1845-53 | Moderators of the effects of exercise training in breast cancer patients receiving chemotherapy: a randomized controlled trial | M va |
| Courneya KS | Ann. Behav. Med. 2008 35(1):116-122 | Barriers to supervised exercise training in a randomized controlled trial of breast cancer patients receiving chemotherapy | G ex |
| Courneya KS | Medicine & Science in Sports & Exercise 2008 40(6):1180-1187 | Predictors of supervised exercise adherence during breast cancer chemotherapy | G ex |

| | | | |
|---|---|---|---|
| Courneya KS | Ann Behav Med 2010 40(1):30-39 | Predictors of adherence to supervised exercise in lymphoma patients participating in a randomized controlled trial | Ga ex |
| Courneya KS | Psycho-Oncology 2012 21(10):1124-1131 | Predictors of follow-up exercise behavior 6 months after a randomized trial of supervised exercise training in lymphoma patients | R( |
| Courneya KS | Breast Cancer Res. Treat. 2009 114(1):179-187 | Predictors of follow-up exercise behavior 6 months after a randomized trial of exercise training during breast cancer chemotherapy | R( |
| Craike MJ | Support Care Cancer 2011 19(7):1019-28 | An exploratory study of the factors that influence physical activity for prostate cancer survivors | N= |
| Demark-Wahnefried W | Journal of clinical oncology : official journal of the American Society of Clinical Oncology 2012 30(19):2354-61 | Reach out to enhance wellness home-based diet-exercise intervention promotes reproducible and sustainable long-term improvements in health behaviors, body weight, and physical functioning in older, overweight/obese cancer survivors | G ke |
| Devitt B | J Thorac Oncol 2010 5(8):1227-32 | What should a support program for people with lung cancer look like? Differing attitudes of patients and support group facilitators | Ga su |
| Duffy SA | Oncol Nurs Forum 2010 37(3):349-56 | Perceived difficulty quitting predicts enrollment in a smoking-cessation program for patients with head and neck cancer | S |
| England R | Respir. Med. 2012 106(2):294-299 | Factors influencing exercise performance in thoracic cancer | Ga fa pe |
| Gjerset GM | Eur J Cancer Care (Engl) 2011 20(1):96-105 | Interest and preferences for exercise counselling and programming among Norwegian cancer survivors | O te ac |
| Haas BK | Cancer Nurs 2011 34(4):322-34 | Fatigue, self-efficacy, physical activity, and quality of life in women with breast cancer | N= |
| Huberty JL | Oncol Nurs Forum 2009 36(5):E266-273 | Development of an instrument to measure adherence to strength training in postmenopausal breast cancer survivors | O in to ui |
| Husebo AM | Journal of Clinical Nursing 2013 22(1-2):4-21 | Predicting exercise adherence in cancer patients and survivors: A systematic review and meta-analysis of motivational and behavioural factors | O ge |
| Ibfelt E | Acta oncologica (Stockholm, Sweden) 2011 50(2):289-98 | No change in health behavior, BMI or self-rated health after a psychosocial cancer rehabilitation: Results of a randomized trial | Ga in be |
| Irwin ML | British Journal of Sports Medicine 2009 43(1):32-38 | Physical activity interventions for cancer survivors | Na |
| Joyce Chung OK | Cancer Nurs. 2013 | The impact of cancer and its treatment on physical activity levels and behavior in Hong Kong Chinese Childhood cancer survivors | Ni ui |
| Kardas P | Front. Pharmacol. 2013 4 JUL( | Determinants of patient adherence: A review of systematic reviews | Ni ka |
| Kim SH | Oncol. Nurs. Forum 2011 38(2):E97-E106 | Randomized pilot test of a simultaneous stage-matched exercise and diet intervention for breast cancer survivors | Ga in be |
| Knols RH | Disability & Rehabilitation 2010 32(22):1819-26 | The relationship between ambulatory step activity, self-reported physical functioning and standardised timed walking in patients with haematological malignancies | G ke |
| Larsson I | Scandinavian Journal of Caring Sciences 2008 22(3):422-429 | Women's experience of physical activity following breast cancer treatment | G ke |
| Latka RN | Journal of cancer survivorship : research and practice 2009 | Adherence to a randomized controlled trial of aerobic exercise in breast cancer survivors: the Yale exercise and | Ga ex |

| | | | |
|---|---|---|---|
| | 3(3):148-57 | survivorship study | |
| Lowe SS | Support Care Cancer 2010 18(11):1469-75 | Physical activity interests and preferences in palliative cancer patients | O te ac |
| McGuire R | PhD | Examining intervention components for promoting adherence to strength weight training exercise in postmenopausal breast cancer survivors with bone loss | Pl |
| McGuire R | West J Nurs Res 2011 33(5):671-89 | Intervention components promoting adherence to strength training exercise in breast cancer survivors with bone loss | G ex |
| Melchers LJ | Int J Oral Maxillofac Surg 2009 38(9):947-54 | Exercise adherence in patients with trismus due to head and neck oncology: a qualitative study into the use of the Therabite | G Th |
| Miller PE | J. Acad. Nutri. Diet. 2012 112(6):824-831.e1 | Dietary Patterns Differ between Urban and Rural Older, Long-Term Survivors of Breast, Prostate, and Colorectal Cancer and Are Associated with Body Mass Index | G ac BI |
| Milne HM | Ann. Behav. Med. 2008 36(2):158-166 | Impact of a combined resistance and aerobic exercise program on motivational variables in breast cancer survivors: A randomized controlled trial | G ex |
| Moon SH | Asian Pacific Journal of Cancer Prevention: Apjcp 2013 14(5):2949-54 | Adherence to health-related lifestyle behavior recommendations and association with quality of life among cancer survivors and age-matched controls in Korea | G ac |
| Mosher CE | J. Health Psychol. 2008 13(8):1105-1112 | Cancer survivors' health worries and associations with lifestyle practices | Ni ui |
| Mosher CE | Psycho-Oncology 2013 22(4):876-885 | Long-term outcomes of the FRESH START trial: exploring the role of self-efficacy in cancer survivors' maintenance of dietary practices and physical activity | G ve de ve |
| Murnane A | Supportive Care Cancer 2012 20(5):957-962 | The exercise programming preferences and activity levels of cancer patients undergoing radiotherapy treatment | G ke |
| Ness KK | Cancer 2010 116(12):3034-44 | Physical performance limitations among adult survivors of childhood brain tumors | Ni ui |
| Ollberding NJ | Public Health Nutrition 2011 14(10):1796-1804 | Comparison of modifiable health behaviours between persons with and without cancer: the Multiethnic Cohort | Ve ka pa |
| Peddle CJ | Oncology Nursing Forum 2009 36(3):287-295 | Correlates of adherence to supervised exercise in patients awaiting surgical removal of malignant lung lesions: results of a pilot study | N= |
| Pekmezi D | ACSM's Health & Fitness Journal 2012 16(4):8-13 | Enhancing Exercise Adherence for Breast Cancer Survivors | Na |
| Pinto BM | Recent Results Cancer Res. 2011 186(367-387 | Physical activity motivation and cancer survivorship | Na |
| Pinto BM | Supportive Care Cancer 2008 16(11):1279-1289 | Maintenance of effects of a home-based physical activity program among breast cancer survivors | G va |
| Pinto BM | Psycho-Oncology 2009 18(4):369-376 | Home-based exercise among cancer survivors: adherence and its predictors | G ex |
| Playdon M | Curr. Breast Cancer Rep. 2013 5(3):222-246 | Weight loss intervention for breast cancer survivors: A systematic review | G ke |
| Pollard A | Cancer Forum 2009 33(3):182-186 | Health behaviour interventions for cancer survivors: An overview of the evidence and contemporary Australian trials | Na |
| Rogers LQ | J Phys Act Health 2008 5(5):688-705 | Factors associated with exercise counseling and program preferences among breast cancer survivors | G vo pr |
| Rogers LQ | Med. Sci. Sports Exerc. 2009 41(4):935-946 | A randomized trial to increase physical activity in breast cancer survivors | G in be |

| | | | |
|---|---|---|---|
| Rogers LQ | Journal of Rural Health 2009 25(4):388-91 | Exercise preference patterns, resources, and environment among rural breast cancer survivors | G vo pr |
| Rogers LQ | Contemp. Clin. Trials 2012 33(1):124-137 | Better exercise adherence after treatment for cancer (BEAT Cancer) study: Rationale, design, and methods | St |
| Rogers LQ | Supportive Care Cancer 2008 16(1):19-27 | Physical activity correlates and barriers in head and neck cancer patients | N= |
| Rogers LQ | J. Sport Exerc. Psychol. 2011 33(2):235-254 | Reduced barriers mediated physical activity maintenance among breast cancer survivors | Ni ui |
| Shang J | PhD | Exercise adherence and contamination in a randomized control trial of a home-based walking program among patients receiving active cancer treatment | Ph |
| Shang J | Cancer Nursing 2012 35(4):312-322 | Who will drop out and who will drop in: exercise adherence in a randomized clinical trial among patients receiving active cancer treatment | G ex |
| Spark LC | J. Cancer Survivorship 2013 7(1):74-82 | Physical activity and/or dietary interventions in breast cancer survivors: A systematic review of the maintenance of outcomes | Ve st er m ef |
| Swenson KK | Oncol Nurs Forum 2010 37(3):321-330 | Physical activity in women receiving chemotherapy for breast cancer: adherence to a walking intervention | G ex |
| Thomson CA | Nutr. Cancer 2010 62(8):1142-52 | Changes in body weight and metabolic indexes in overweight breast cancer survivors enrolled in a randomized trial of low-fat vs. reduced carbohydrate diets | G ke |
| Travier N | Med. Oncol. 2014 31(1): | Effect of a diet and physical activity intervention on body weight and nutritional patterns in overweight and obese breast cancer survivors | G ke |
| Trinh L | Supportive Care Cancer 2012 20(8):1709-1717 | Physical activity preferences in a population-based sample of kidney cancer survivors | G vo pr |
| Vallance J | Am J Health Behav 2010 34(2):225-236 | Understanding physical activity maintenance in breast cancer survivors | Ni ui |
| Vallance JK | Med. Sci. Sports Exerc. 2008 40(1):173-180 | Maintenance of physical activity in breast cancer survivors after a randomized trial | R |
| Van Waas M | J. Pediatr. Hematol. Oncol. 2013 35(5):361-365 | Daily life physical activity in long-term survivors of nephroblastoma and neuroblastoma | G ke |
| von Gruenigen VE | Health & Quality of Life Outcomes 2009 7(17): | A randomized trial of a lifestyle intervention in obese endometrial cancer survivors: quality of life outcomes and mediators of behavior change | G ke ac |
| White SM | Ann. Behav. Med. 2009 37(1):10-19 | Translating physical activity interventions for breast cancer survivors into practice: An evaluation of randomized controlled trials | G ex R |
| Wilkinson AV | Psycho-Oncology 2012 21(1):108-113 | Extant health behaviors and uptake of standardized vs tailored health messages among cancer survivors enrolled in the FRESH START trial: a comparison of fighting-spirits vs fatalists | G ex |
| Zhao G | J 2013 7(4):563-9 | Trends in modifiable lifestyle-related risk factors following diagnosis in breast cancer survivors | G pr ris |

*26. Evidence tables healthy lifestyle*

# 4 Evidence Report gezonde leefstijl

# Vraag 1: kenmerken voor het zelfstandig oppakken / handhaven van een gezonde leefstijl

Primaire studies

| Study ID | Method | Patient characteristics | Interventions & variables | Results |
|---|---|---|---|---|
| Basen-Engquist 2013 | · Design: prospective longitudinal study<br>· Funding/CoI: National Institutes of Health Grants; CoI not reported<br>· Setting: 1 university and 1 private centre, US<br>· Sample size: N=100<br>· Duration: recruitment Jan 2007 – Sept 2010 | · Eligibility criteria: women who had been diagnosed with Stage I, II, or IIIa endometrial cancer and were at least 6 months posttreatment with no evidence of disease; exclusion if they met the public health recommendations for physical activity (moderate or greater intensity on at least 5 days per week for 30 min or more, or vigorous intensity activity for 20 min or more on at least 3 days per week) and had maintained that level of activity for 6 months or longer<br>· *A priori* patient characteristics:<br>o Mean age: 57y<br>o Mean time since diagnosis: 26m<br>o Mean BMI: 34.2 | Exercise recommendation tailored to fitness level provided by masters-level exercise physiologist<br><br>Variables included in analysis:<br>· Social-Cognitive Theory variables: exercise self-efficacy, outcome expectations (positive and negative), barriers self-efficacy<br>· BMI | · Exercise self-efficacy was only variable that significantly predicted exercise minutes at next time point (p=0.0069 in multivariate model) |
| Bélanger 2012 | · Design: cross-sectional survey<br>· Funding/CoI: Lisa Belanger is supported by the Alberta Innovates: Health Solutions studentship award; Kerry Courneya is supported by the Canada Research Chairs Program; Alexander Clark is supported by career awards from the Canadian Institutes for Health Research and Alberta Innovates: Health Solutions<br>· Setting: Alberta, Canada<br>· Sample size: N=588<br>· Duration: patients diagnosed in 2008 | · Eligibility criteria: young adult cancer survivors being diagnosed with invasive cancer between the ages of 20-44 and currently still between the ages of 20-44<br>· *A priori* patient characteristics:<br>o Mean age: 38.2y<br>o Females: 70%<br>o Mean time since diagnosis: 73.6m<br>o Mean BMI: 26.5 | Dependent variable: physical activity (Leisure Score Index from the Leisure-Time Exercise Questionnaire) and %of participants meeting public health physical activity guidelines (2008 physical activity guidelines for Americans)<br><br>Independent variables:<br>· Theory of Planned Behavior variables (affective attitude, instrumental attitude, injunctive | · Path analysis explained 3<br>(p<0.001) of the variance in physical activity with significa contributions from intention, planning, affective attitude, education, and general health<br>· 56% (p<0.001) of the varia in intention was explained by perceived behavioral control, instrumental attitude, and affe attitude |

| | | | | |
|---|---|---|---|---|
| | | | norm, descriptive norm, perceived control, planning, intention)<br>· Demographic, medical and behavioural variables | |
| Blaney 2013 | · Design: cross-sectional survey<br>· Funding/CoI: funded by the Department for Employment and Learning, Northern Ireland; no CoI<br>· Setting: service users of supportive care cancer charity in Northern Ireland<br>· Sample size: N=456<br>· Duration: carried out in 2008 | · Eligibility criteria: cancer survivors<br>· *A priori* patient characteristics:<br>o Median age: 61y<br>o Females: 76%<br>o Mainly breast cancer (64.4%)<br>o Median BMI: 29.04 | Exercise frequency and intensity were measured using the Leisure Score Index (LSI) of the Godin Leisure-Time Exercise Questionnaire | · Top 10 barriers interfering exercise participation: illness/ health problems (37.3%), join stiffness (36.9%), fatigue (35. pain (30.1%), lack of motivatio (26.5%), weather extremes (26.2%), lack of facilities (25.5 weakness (21.5%), lack of int (20.7%) and fear of falling (19<br>· Top 10 facilitators: fun (88 included a variety of exercises (81.8%), gradually progressed (78.9%), flexible (75.5%), invo personal goal setting (73.9%) included good music (73.2%), tailored to the individual (73.1 included feedback (66.2%) an approved by their oncologist (65.7%) or general practitione (60.3%) |
| Brunet 2011 | · Design: cross-sectional analysis of prospective longitudinal study<br>· Funding/CoI: supported by a Canadian Institutes of Health Research Grant awarded to the second author; the first author is supported by a Joseph-Armand Bombardier Canada Graduate Scholarship from Social Sciences and Humanities Research Council of Canada and a Psychosocial Oncology Research Training doctoral award<br>· Setting: Quebec, Canada<br>· Sample size: N=169<br>· Duration: 2009-2010 | · Eligibility criteria: women aged 18+, 0-20 weeks after primary treatment for stage I-III breast cancer; no health concerns that prevent them from engaging in physical activity<br>· *A priori* patient characteristics:<br>o Mean age: 55.06y<br>o Mean BMI: 26.21<br>o Time since diagnosis: 10.59m | Variables:<br>·<br>Self-presentation processes : SPEQ<br>· Social cognitive constructs: SPES (self-presentation efficacy scale)<br>· Physical activity behaviour: LTEQ (Leisure-Time Exercise Questionnaire) | · Impression motivation was significant correlate of moderate-to-vigorous physica activity ( = 0.25)<br>· SPEE ( = 0.21) and SPC =0 .27) were moderators of th relationship<br>· The final models accounte 12–24% of the variance in moderate-to-vigorous physica activity |
| Chipperfield 2013 | · Design: cross-sectional survey<br>· Funding/CoI: supported by Abbott Pharmaceuticals grant #IIS MET-11-0029 and | · Eligibility criteria: men aged 40-80y at completion of radiotherapy for prostate cancer; radiotherapy between 9-30m ago | Dependent variable: patients meeting National Physical Activity Guidelines of Australia | · The odds of meeting NPA were significantly higher with depression scores (OR 0.84 [95%CI 0.76-0.94], p<0.01)<br>· Participants with a tertiary education were significantly m |

| | | | | |
|---|---|---|---|---|
| | Cabrini Institute, Cabrini Health Scholarship #1068651; no other CoI<br>· Setting: three centres, Melbourne, Australia<br>· Sample size: N=356<br>· Duration: 2010-2011 (data collection over 12-month period) | · *A priori* patient characteristics:<br>o Mean age: 67.4y<br>o Mean time since diagnosis: 33.1m | (NPAGA); physical activity measured with IPAQ (International Physical Activity Questionnaire)<br><br>Independent variables:<br>· Quality of life: prostate cancer subscale of the FACT-P<br>· Depression and anxiety: HADS<br>· Demographic and medical characteristics | likely to be meeting NPAGA th those with primary/secondary school (OR 0.61 [95%CI 0.38- p<0.05) or TAFE/apprenticesh qualifications (OR 0.25 [95%C 0.09-0.68], p<0.01)<br>· Treatment category, comc conditions, age, anxiety and C were not significantly associat with meeting NPAGA |
| Cox 2009 | · Design: cross-sectional survey as part of longitudinal cohort study<br>· Funding/CoI: NIH, NINR RO3 NR009203, Robert Wood Johnson Foundation, NIH NCI U24 CA55727, American Lebanese Syrian Associated Charities<br>· Setting: multicentre study, US & Canada<br>· Sample size: N=838<br>· Duration: unclear | · Eligibility criteria: persons who had survived five or more years after treatment for malignant disease diagnosed (before age 21) between 1970 and 1986<br>· *A priori* patient characteristics:<br>o Not reported | Dependent variable: physical activity participation (participants were asked: “During the past month, did you participate in any physical activities or exercises such as running, calisthenics, golf, bicycling, swimming, wheelchair basketball, or walking for exercise?”)<br><br>Independent variables:<br>· Directly observed variables: primary-care physician's familiarity with cancer-related problems, current pain resulting from cancer or its treatment, frequency of fatigue, whether survivors had discussed the risk of recurrent cancer with their primary-care physician, baseline frequency of | · 40% of the variance in ma survivors' recent physical activ participation was explained di and/or indirectly by self-report health fears (p=0.01), perceiv primary-care physician expert (p=0.01), baseline exercise frequency (p≤0.001), educatio level (p=0.01), self-reported stamina (p=0.01), cancer-rela pain (p≤0.001), fatigue (p≤0.0 age at diagnosis (p=0.01), cancer-related anxiety (p≤0.0 motivation (p=0.01), affect (p=0.01), and discussion of subsequent cancer risk with th primary-care physician (p≤0.0<br>· 31% of the variance in fem recent physical activity particip was explained directly and/or indirectly by self-reported stan (p≤0.001), fatigue (p=0.01), baseline exercise frequency (p=0.01), cancer-related pain (p≤0.001), cancer-related anx (p=0.01), recency of visits with primary-care physician (<0.00 quality of interaction with the primary-care physician (p=0.0 and motivation (p≤0.001) |

| | | | | |
|---|---|---|---|---|
| | | | aerobic exercise, age at diagnosis, current anxiety as a result of cancer or its treatment, current highest school grade completed, whether the survivor had seen a primary care physician since cancer treatment ended, intrinsic motivation, extrinsic motivation<br>· Latent variables: survivor-provider interaction, fear, affect, and stamina | |
| Gjerset 2011 | · Design: cross-sectional survey<br>· Funding/CoI: funded by the Norwegian Foundation for Health and Rehabilitation and the Norwegian Cancer Society<br>· Setting: Norwegian Radium Hospital<br>· Sample size: N=975<br>· Duration: 2/2007 – 9/2007 | · Eligibility criteria: patients aged 18-75y that had received curatively intended treatment for malignant lymphoma, breast, testicular, cervical, ovarian or prostate cancer<br>· *A priori* patient characteristics:<br>o Age 45-64y: 48%<br>o Females: 56%<br>o BMI < 25: 48%<br>o Time since diagnosis ≥2y: 89% | Dependent variable: level of physical activity participation (modified version of Godin Leisure-Time Exercise Questionnaire)<br><br>Independent variables:<br>· Medical and demographic variables | · Increasing age and weigh education, comorbidity and smoking were associated with physical inactivity after treatm<br>· Change in level of physica activity from active to inactive associated with comorbidity, d disease and smoking, while a change from inactive to active associated with high educatio |
| Harrison 2009 | · Design: longitudinal cohort study<br>· Funding/CoI: National Breast Cancer Foundation, Australia<br>· Setting: Queensland, Australia<br>· Sample size: N=287<br>· Duration: unclear | · Eligibility criteria: women with primary, invasive, unilateral breast cancer (diagnosed in 2002), aged 20-74y<br>· *A priori* patient characteristics:<br>o Mean age: 55y | Dependent variable: physical activity (Behavioral Risk Factor Surveillance System), converted to metabolic equivalent task (MET) hours/week, and categorized according to national physical activity guidelines<br><br>Independent variables:<br>· Medical, behavioural and demographic variables | · Nine variables showed associations with change in physical activity levels from 6 months following diagnosis, collectively explaining 35% of variance<br>· The only statistically signif factor was treatment-related complications: mean adjusted change in MET = 17.7 (95%C 3.0-32.4) if no complications (p=0.01) |

| | | | | |
|---|---|---|---|---|
| Hsu 2011 | · Design: prospective longitudinal study<br>· Funding/CoI: Department of Defense of US Army (DAMD17 – 03 – 1 – 0521), excellence for cancer research center grant, No: DOH99-TD-C-111-002, Department of Health, Executive Yuan, Taiwan and grants from the Kaohsiung Medical University Hospital, Taiwan (KMUH95-5D10, KMUH96-6G17); no CoI<br>· Setting: 3 teaching hospitals in metropolitan areas of north and south Taiwan<br>· Sample size: N=196<br>· Duration: 2003-2005 | · Eligibility criteria: women aged 18+ with confirmed first diagnosis of breast cancer and completed therapy; currently in remission; absence of recurrent disease after initial breast cancer treatment<br>· *A priori* patient characteristics:<br>o Mean age: 47y | Dependent variable: exercise frequency (21-item exercise log)<br><br>Independent variables:<br>· demographic variables, fatigue, perceived health status, social support for exercise, perceived barriers for exercise, exercise self-efficacy, exercise outcome expectancy | · Baseline exercise frequen was the best significant predic exercise frequency<br>· The effect of social suppo exercise on exercise frequenc apparently larger in older subj especially those over 40 years than in younger subjects<br>· Mental health, exercise ba and exercise outcome expecta significantly contributed to cha in exercise frequency |
| Huy 2012 | · Design: retrospective cohort study<br>· Funding/CoI: Deutsche Krebshilfe e. V. [Grant No. 70-2892-BR I and 108523/108419], the Hamburg Cancer Society, the German Cancer Research Centre, and the German Federal Ministry for Education and Research [Grant No. 01KH0402]<br>· Setting: German region<br>· Sample size: N=1067<br>· Duration: 2002-2010 | · Eligibility criteria: women with primary invasive breast cancer or carcinoma in situ (that had undergone mastectomy or lumpectomy)<br>· *A priori* patient characteristics:<br>o Mean age: 63.5y<br>o Mean BMI: 26.3 | Dependent variable: physical activity measured with questionnaire and converted to MET-hours per week<br><br>Independent variables:<br>· breast cancer-related variables, patient-related variables | · Patients treated with chemotherapy, radiotherapy, both had a stronger decline in physical activity during therap the first 3 months after surger respectively, compared to pat without therapy or those treate only with hormones (adjusted -9.73 [95%CI -18.55 to -0.91] -13.54 [-21.93 to 5.15]; p<0.<br>· Overall decline in physical activity was greater in patients treated with chemo- ( = 15. [ 30.28 to -0.55]; p=0.042) or radiotherapy ( = -12.56 [-24. -0.15]; p=0.047)<br>· Participation in rehabilitati was positively associated with increase in physical activity af breast cancer therapy ( = 7.6 [2.63 to 12.61]; p=0.003)<br>· There was a negative association for age considerin overall change in physical act after controlling for other cova ( = -0.66 [-1.22 to -0.10] per p=0.020)<br>· No significant associations BMI, WHR, or other patient-re variables<br>· Patients with medical risk factors had a stronger decline physical activity during therap compared to those without the conditions ( = -5.56 [-9.59 to -1.53]; p=0.007) |

| | | | | |
|---|---|---|---|---|
| | | | | · The presence of medical r factors was also a negative predictor for overall change in leisure-time physical activity ( -8.25 [ 14.26 to -2.24]; p=0.0 · No further significant resu other clinical characteristics · Patients with a higher prediagnostic physical activity had a greater decline in physi activity during therapy ( = -0. [-0.83 to 0.72) per MET-h/we < .001) · Significant associations fo change after therapy and ove change in total leisure-time ph activity · Smoking and alcohol consumption were not signific associated with change in phy activity in adjusted analyses |
| Karvinen 2009 | · Design: retrospective cohort study · Funding/CoI: University of Alberta–EFF Support for the Advancement of Scholarship Small Faculties Research Grant and a Research Team Grant from the National Cancer Institute of Canada with funds from the Canadian Cancer Society and the NCIC/CCS Sociobehavioral Cancer Research Network · Setting: Alberta, Canada · Sample size: N=397 · Duration: 10/2005 – 2/2006 | · Eligibility criteria: patients 18+ with diagnosis of bladder cancer within the last 15 years · *A priori* patient characteristics: o Mean age: 70.2 o Females: 25.3% o Mean time since diagnosis: 72.4m | Dependent variable: exercise behaviour (Leisure Score Index from the Godin Leisure Time Exercise Questionnaire)<br><br>Independent variables: · Theory of Planned Behavior variables (affective attitude, instrumental attitude, injunctive norm, descriptive norm, perceived control, planning, intention) · Demographic and medical variables | · Intention ( =0.25, p<0.00 perceived behavioral control ( =0.18, p=0.001), and planni ( =0.12, p=0.018) explained 2 of the variance in exercise ov 3-month period · Perceived behavioral cont ( =0.32, p<0.001), affective a ( =0.18, p=0.002), instrument attitude ( =0.15, p=0.025) an descriptive norm ( =0.10, p=0 explained 39.1% of the variab exercise intention · Constructs from the TPB mediated the associations bet adjuvant therapy, cancer invasiveness, age, and exerci · Age and adjuvant therapy moderated some of the associations within the TPB |
| McGowan 2013 Speed-Andrews 2012 | · Design: cross-sectional survey · Funding/CoI: not reported · Setting: Alberta, Canada · Sample size: N=600 · Duration: May – Aug 2008 | · Eligibility criteria: patients diagnosed with colorectal cancer aged 18+ that completed adjuvant therapy · *A priori* patient characteristics: o Mean age: 67.3y o Females: 41.7% o Mean time since diagnosis: 51m | Dependent variable: (1) physical activity (Leisure Score Index from the Godin Leisure Time Exercise Questionnaire) and percentage of participants meeting 2008 Physical Activity Guidelines for Americans; (2) sport participation | · The TPB explained 34% (p<0.001) of the variance in physical activity behaviour wit direct associations for intentio 0.22; p=0.001) and planning ( 0.18; p=0.015) · Intention had 62% (p<0.00 its variance explained by perc behavioural control ( = 0.43; p<0.001), affective attitude ( 0.25; p<0.001) and instrumen attitude ( = 0.15; p<0.001) · 33.0% (p=0.001) of the variance in sport participation explained by being male ( =0 |

| | | | | |
|---|---|---|---|---|
| | | | rate, sport preferences<br><br>Independent variables:<br>· Theory of Planned Behavior variables (affective attitude, instrumental attitude, injunctive norm, descriptive norm, perceived control, planning, intention)<br>· Demographic and medical variables<br>Dependent variable: physical exercise (Godin Leisure Time Exercise Questionnaire) | p=0.006), in better general he<br>( =0.12; p=0.006), and ≥5 yea<br>post-diagnosis ( =0.09; p=0.0<br>· The most common barrier<br>sport participation were time,<br>age/agility, and no interest/dis<br>sports<br>· The most common anticip<br>benefits of sport participation<br>improved physical fitness, me<br>people, and improved health |
| Milne 2008 | · Design: cross-sectional survey<br>· Funding/CoI: Courneya is supported by the Canada Research Chairs Program and a Research Team Grant from the National Cancer Institute of Canada with funds from the Canadian Cancer Society and the NCIC/CCS Sociobehavioral Cancer Research Network<br>· Setting: Western Australia<br>· Sample size: N=558<br>· Duration: May – Dec 2004 | · Eligibility criteria: women diagnosed in 2002 with breast cancer aged 18+, no longer undergoing active treatment, no secondary cancers<br>· *A priori* patient characteristics:<br>o Mean age: 59y<br>o Mean time since diagnosis: 25.2m | Independent variables:<br>· Demographic and medical variables<br>· Self-determination theory (SDT) motivation continuum: Behavioural Regulation for Exercise Questionnaire-2<br>· Competence and autonomy support: Perceived Competence Scale (PCS) and modified Health Care Climate Questionnaire (mHCCQ) | · SDT constructs explained<br>20.2% (p<0.01) of the physica<br>activity variance<br>· Significant independent Si<br>predictors included identified<br>regulation ( = 0.14, p<0.05) a<br>competence ( = 0.23, p<0.01<br>with autonomy support approa<br>significance ( = 0.9, p=0.057 |
| Ng 2008 | · Design: cross-sectional survey<br>· Funding/CoI: funding not reported; no CoI<br>· Setting: 4 Harvard-affiliated hospitals, US<br>· Sample size: N=511<br>· Duration: diagnosis made between 1969 and 1996 | · Eligibility criteria: patients with Hodgkin's lymphoma aged 18+, 5 or more years from diagnosis<br>· *A priori* patient characteristics:<br>o Median: 26y<br>o Females: 50% | Dependent variable: health practice (routine physical examination and dental visit in the past year; smoking; daily alcohol consumption; physical activity) | · Higher household income<br>(OR=1.48, 95%CI 1.09-2.02;<br>p=0.01) independently predict<br>having had a physical examin<br>in the past year<br>· Lower educational level<br>(OR=3.3, 95%CI 1.64-5.56;<br>p=0.0004) and history of relap<br>Hodgkin's lymphoma (OR=2.1<br>95%CI 1.07-3.91; p=0.03) we<br>independent predictors for<br>smoking, moderate/heavy alc |

| | | | | |
|---|---|---|---|---|
| | | | Independent variables: age at Hodgkin's lymphoma diagnosis (≤50 vs. >50), gender, time since Hodgkin's lymphoma treatment (<10 years, 10–15 years vs. >15 years), annual household income (<$60,000 vs. $$60,000), educational level (<college level vs. college level or higher), history of Hodgkin's lymphoma relapse or second cancer, and reported level of concern regarding future health and cancer risks | use, and/or physical inactivity |
| | | | Dependent variable: exercise behaviour (Leisure Score Index from the Godin Leisure Time Exercise Questionnaire) | |
| Peddle 2008 | · Design: cross-sectional survey<br>· Funding/CoI: University of Alberta–Social Sciences Research Grant Program; CoI reported in detail<br>· Setting: Alberta, Canada<br>· Sample size: N=413<br>· Duration: June – Sept 2004 | · Eligibility criteria: patients aged 20-80y diagnosed with colorectal cancer and completed adjuvant therapy for at least 1y; no evidence of recurrent disease<br>· *A priori* patient characteristics:<br>o Mean age: 60y<br>o Females: 46%<br>o Mean BMI: 29.0 | Independent variables:<br>· Self-determination theory (SDT) variables (behavioural regulation, perceived autonomy support, psychological need satisfaction in exercise)<br>· Demographic and medical variables | · SDT and education explai 16% of the variance in exercis behavior: identified regulation ( =0.17, p=0.031), introjected regulation ( =0.15, p=0.006), education ( =0.16, p<0.001) e making a significant independ contribution |
| Soerjomataram 2012 | · Design: cross-sectional survey<br>· Funding/CoI: internal grant from the Public Health Department of Erasmus MC; data collection was supported by Comprehensive Cancer | · Eligibility criteria: patients diagnosed with colorectal cancer between 1998 and 2007<br>· *A priori* patient characteristics:<br>o Age 65+: 57%<br>o More than 5y since diagnosis: 30% | Dependent variable: lifestyle behaviour (smoking, alcohol consumption, weight)<br><br>Independent variables: | · Having received chemoth was significantly associated w being overweight (adjusted OR=1.5, 95%CI 1.05-2.3) and consuming alcohol (adjusted OR=1.7, 95%CI 1.1-2.7)<br>· Female patients were les likely than males to currently s (OR=0.5, 95%CI 0.4-0.8), con |

| | | | | |
|---|---|---|---|---|
| | Centre South; no CoI<br>· Setting: Eindhoven, the Netherlands<br>· Sample size: N=1349<br>· Duration: conducted in 2009 | | · Demographic and medical variables | alcohol (OR=0.3, 95%CI 0.2-0<br>be overweight (OR=0.6, 95%C<br>0.5-0.8)<br>· Survivors from the lowest socioeconomic group were mo likely to be current smokers (OR=1.8, 95%CI 1.1-3.0) and overweight (OR=1.5, 95%CI 1.1-2.1) |
| Stevinson 2009 | · Design: cross-sectional survey<br>· Funding/CoI: niversity of Alberta and a Research Team Grant from the National Cancer Institute of Canada, with funds from the Canadian Cancer Society and the NCIC/CCS Sociobehavioral Cancer Research Network<br>· Setting: Alberta, Canada<br>· Sample size: N=359<br>· Duration: May – Oct 2006 | · Eligibility criteria: women aged 18+, diagnosed with ovarian cancer between 1985 and 2005<br>· *A priori* patient characteristics:<br>o Age 60+: 22%<br>o Time since diagnosis <5y: 25% | Dependent variable: physical activity (Leisure Score Index from the Godin Leisure Time Exercise Questionnaire)<br><br>Independent variables:<br>· Theory of Planned Behavior variables (affective attitude, instrumental attitude, injunctive norm, descriptive norm, perceived control, planning, intention)<br>· Demographic and medical variables | · 36% of the variance in ph activity guidelines was explain the Theory of Planned Behavi variables, with intention being sole independent correlate ( 0.56; p<0.001)<br>· Adding significant medica demographic variables explain an additional significant 6% of variance in physical activity behavior, with being disease-f ( = 0.09; p=0.03), having a h BMI ( = 0.12; p=0.005), and better educated ( = 0.14; p=0 achieving independent associ with behavior, although intenti remained the most important correlate ( = 0.51; p<0.001) |
| Trinh 2012 | · Design: cross-sectional survey<br>· Funding/CoI: grants described in article; no CoI<br>· Setting: Alberta, Canada<br>· Sample size: N=703<br>· Duration: unclear | · Eligibility criteria: patients aged 18+ diagnosed with kidney cancer between 1996 and 2010<br>· *A priori* patient characteristics:<br>o Mean age: 64.4y<br>o Females: 37.6%<br>o Mean time since diagnosis: 68.6m<br>o Mean BMI: 28.6 | Dependent variable: physical activity (Leisure Score Index from the Godin Leisure Time Exercise Questionnaire)<br><br>Independent variables:<br>· Theory of Planned Behavior variables (affective attitude, instrumental attitude, injunctive norm, descriptive norm, perceived control, planning, intention)<br>· Demographic and medical variables | · 42% of the variance in ph activity guidelines was explain the Theory of Planned Behavi variables<br>· There were significant pathways from perceived behavioural control ( = 0.18, p=0.02), planning ( = 0.22, p<0.01) and intention ( = 0.3 p<0.01) to physical activity<br>· There were strong signific total effects of perceived behavioural control ( = 0.43, p<0.01) and intention ( = 0.4 p<0.01) on physical activity<br>· There were significant tot effects of instrumental attitude 0.14, p=0.02), descriptive nor = 0.04, p=0.01), and planning 0.22, p<0.01) on physical acti |
| Vallance 2012 | · Design: cross-sectional survey<br>· Funding/CoI: Project Interface Grant from | · Eligibility criteria: women aged 18+ with stage I-IIIa breast cancer who had completed | Dependent variable: physical activity (Leisure Score Index from | · Physical activity intention explained 12% of the variance physical activity behaviour (p< while the Theory of Planned |

| | | | | |
|---|---|---|---|---|
| | Alberta Health Services – Cancer Corridor<br>· Setting: Alberta, Canada<br>· Sample size: N=524<br>· Duration: Sept – Oct 2009 | adjuvant therapy (except hormonal therapy)<br>· *A priori* patient characteristics:<br>o Mean age: 62.4y<br>o Mean time since diagnosis: 76.4m | the Godin Leisure Time Exercise Questionnaire)<br><br>Independent variables:<br>· Theory of Planned Behavior variables (affective attitude, instrumental attitude, injunctive norm, descriptive norm, perceived control, planning, intention)<br>· Demographic and medical variables | Behavior constructs together explained 43% of the variance physical activity intention (p<0<br>· Intention had a significant direct effect on physical activit behaviour ( = 0.26, p<0.001) |
| Yang 2013 | · Design: cross-sectional survey<br>· Funding/CoI: National Cancer Center (grant no. 0910191 and 1210150); no CoI<br>· Setting: 10 centres, South-Korea<br>· Sample size: N=493<br>· Duration: conducted in 2009 | · Eligibility criteria: patients aged 18+ diagnosed with cancer<br>· *A priori* patient characteristics:<br>o Mean age: 59.1y<br>o Mean time since diagnosis: 2.4y<br>o Females: 8.1% | Dependent variable: continued smoking<br><br>Independent variables:<br>· Perceived social support<br>· Demographic and medical variables | · Current alcohol consump (OR = 3.29; 95%CI 1.91-5.65) early cancer stage (p for trend 0.01), lung cancer diagnosis ( 0.41; 95%CI 0.19-0.88), and h perceived social support (OR 0.59; 95%CI 0.37-0.96) showe significant associations with continued smoking |

Abbreviations: 95%CI: 95% confidence interval; BMI: body mass index; CoI: conflicts of interest; IPAQ: International Physical Activity Questionnaire; LSI: Leisure Score Index; LTEQ: Leisure-Time Exercise Questionnaire; MA: meta-analysis; MET: metabolic equivalent task; NPAGA: National Physical Activity Guidelines of Australia; OR: odds ratio; RCT: randomized controlled trial; SDT: self-determination theory; SPES: self-presentation efficacy scale; SR: systematic review; TPB: theory of planned behavior; WHR: waist-hip ratio.

**References**

Basen-Engquist K, Carmack CL, Li Y, Brown J, Jhingran A, Hughes DC, et al. Social-cognitive theory predictors of exercise behavior in endometrial cancer survivors. Health Psychol. 2013;32(11):1137-48.

Belanger LJ, Plotnikoff RC, Clark AM, Courneya KS. Determinants of physical activity in young adult cancer survivors. Am J Health Behav. 2012;36(4):483-94.

Blaney JM, Lowe-Strong A, Rankin-Watt J, Campbell A, Gracey JH. Cancer survivors' exercise barriers, facilitators and preferences in the context of fatigue, quality of life and physical activity participation: a questionnaire-survey. Psychooncology. 2013;22(1):186-94.

Brunet J, Sabiston CM. Self-presentation and physical activity in breast cancer survivors: the moderating effect of social cognitive constructs. J Sport Exerc Psychol. 2011;33(6):759-78.

Chipperfield K, Fletcher J, Millar J, Brooker J, Smith R, Frydenberg M, et al. Factors associated with adherence to physical activity guidelines in patients with prostate cancer. Psycho-Oncology. 2013;22(11):2478-86.

Cox CL, Montgomery M, Oeffinger KC, Leisenring W, Zeltzer L, Whitton JA, et al. Promoting physical activity in childhood cancer survivors: results from the Childhood Cancer Survivor Study. Cancer. 2009;115(3):642-54.

Gjerset GM, Fossa SD, Courneya KS, Skovlund E, Jacobsen AB, Thorsen L. Interest and preferences for exercise counselling and programming among Norwegian cancer survivors. Eur J Cancer Care (Engl). 2011;20(1):96-105.

Harrison S, Hayes SC, Newman B. Level of physical activity and characteristics associated with change following breast cancer diagnosis and treatment. Psycho Oncology. 2009;18(4):387-94.

Hsu H-T, Dodd MJ, Guo S-E, Lee KA, Hwang S-L, Lai Y-H. Predictors of exercise frequency in breast cancer survivors in Taiwan. J Clin Nurs. 2011;20(13-14):1923-35.

Huy C, Schmidt ME, Vrieling A, Chang-Claude J, Steindorf K. Physical activity in a German breast cancer patient cohort: One-year trends and characteristics associated with change in activity level. Eur. J. Cancer. 2012;48(3):297-304.

Karvinen KH, Courneya KS, Plotnikoff RC, Spence JC, Venner PM, North S. A prospective study of the determinants of exercise in bladder cancer survivors using the Theory of Planned Behavior. Support Care Cancer. 2009;17(2):171-9.

McGowan EL, Speed-Andrews AE, Rhodes RE, Blanchard CM, Culos-Reed SN, Friedenreich CM, et al. Sport participation in colorectal cancer survivors: an unexplored approach to promoting physical activity. Support Care Cancer. 2013;21(1):139-47.

Milne HM, Wallman KE, Guilfoyle A, Gordon S, Corneya KS. Self-determination theory and physical activity among breast cancer survivors. J Sport Exerc Psychol. 2008;30(1):23-38.

Ng AK, Li S, Recklitis C, Diller LR, Neuberg D, Silver B, et al. Health Practice in Long-Term Survivors of Hodgkin's Lymphoma. Int. J. Radiat. Oncol. Biol. Phys. 2008;71(2):468-76.

Peddle CJ, Plotnikoff RC, Wild TC, Au H-J, Courneya KS. Medical, demographic, and psychosocial correlates of exercise in colorectal cancer survivors: an application of self-determination theory. Support Care Cancer. 2008;16(1):9-17.

Soerjomataram I, Thong MSY, Korfage IJ, Polinder S, Van Der Heide A, De Vries E, et al. Excess weight among colorectal cancer survivors: Target for intervention. J. Gastroenterol. 2012;47(9):999-1005.

Speed-Andrews AE, Rhodes RE, Blanchard CM, Culos-Reed SN, Friedenreich CM, Belanger LJ, et al. Medical, demographic and social cognitive correlates of physical activity in a population-based sample of colorectal cancer survivors. Eur J Cancer Care (Engl). 2012;21(2):187-96.

Stevinson C, Tonkin K, Capstick V, Schepansky A, Ladha AB, Valance JK, et al. A population-based study of the determinants of physical activity in ovarian cancer survivors. J Phys Act Health. 2009;6(3):339-46.

Trinh L, Plotnikoff RC, Rhodes RE, North S, Courneya KS. Correlates of physical activity in a population-based sample of kidney cancer survivors: an application of the theory of planned behavior. International Journal of Behavioral Nutrition & Physical Activity. 2012;9(96).

Vallance JK, Lavallee C, Culos-Reed NS, Trudeau MG. Predictors of physical activity among rural and small town breast cancer survivors: an application of the theory of planned behaviour. Psychology Health & Medicine. 2012;17(6):685-97.

Yang H-K, Shin D-W, Park J-H, Kim S-Y, Eom C-S, Kam S, et al. The association between perceived social support and continued smoking in cancer survivors. Jpn J Clin Oncol. 2013;43(1):45-54.

*27. Literature search effectiveness rehabilitation*

# Zoekverantwoording effectiviteit revalidatie

# 1 Key question

What is the effectiveness of rehabilitation during curative cancer treatment on survival / cancer recurrence / quality of life / tumour markers / compliance with cancer treatment / fatigue / physical condition / social participation / return to work / psychological well-being / cognitive functioning / emotional functioning, role functioning?

Patient population: cancer patients during curative cancer treatment (radiotherapy, chemotherapy, immunotherapy)

Intervention: cancer rehabilitation (physical exercise / training, psychological treatment, nutritional interventions, return to work interventions)

Comparison: usual care / no intervention

Outcome: survival / cancer recurrence / quality of life / tumour markers / compliance with cancer treatment / fatigue / physical condition / social participation / return to work / psychological well-being / cognitive functioning / emotional functioning, role functioning

# 2 Golden hits

- Mishra SI, Scherer RW, Snyder C, Geigle PM, Berlanstein DR, Topaloglu O. Exercise interventions on health-related quality of life for people with cancer during active treatment. The Cochrane database of systematic reviews. 2012;8:Cd008465.

- Speck, R. M. et al. An update of controlled physical activity trials in cancer survivors: a systematic review and meta-analysis. J Cancer Surviv 2010 4(2): 87-100.

- Midtgaard J, Christensen JF, Tolver A, Jones LW, Uth J, Rasmussen B, Tang L, Adamsen L, Rørth M Efficacy of multimodal exercise-based rehabilitation on physical activity, cardiorespiratory fitness, and patient-reported outcomes in cancer survivors: a randomized, controlled trial. Annals of Oncology 00: 1–7, 2013

- Galway K, Black A, Cantwell M, Cardwell CR, Mills M, Donnelly M. Psychosocial interventions to improve quality of life and emotional wellbeing for recently diagnosed cancer patients.
Cochrane Database Syst Rev. 2012 Nov 14;11:CD007064. doi: 10.1002/14651858.CD007064.pub2

# 3 Search strategy

The searches were run on April 2014. Pubmed Medline, Embase, PsychInfo, CINAHL, PEDRO were searched. Detailed search strings are given below. The searches were limited to 2008-2014, English and Dutch. Study types: systematic reviews and meta-analysis.

# 4 Search results

The Medline search yielded 678 hits, while the search in Embase yielded 224 hits, Psychinfo yielded 83 hits, Cochrane yielded 261 hits, CINAHL yielded 254 hits, PEDRO yielded 178 hits.

After merging the search files into one file and removal of the duplicates 1314 records were screened on title and abstract. Of these 1229 were excluded. The most important reasons for exclusion was that studies were

1. No cancer patients or not during treatment
2. No cancer rehabilitationOf the remaining 57 studies, the full text was retrieved. Based on the full text, an additional ?? studies were excluded. Table 1 provides an overview of the studies, with the reason for exclusion.
3.
4.

| # | Reference | Reason(s) for exclusion |
|---|---|---|
| 1 | Albrecht TA, Taylor AG. Physical activity in patients with advanced-stage cancer: a systematic review of the literature. Clinical journal of oncology nursing. 2012;16(3):293-300. | Population is not target population Advanced stage / metastatic |
| 2 | Alcantara J, Alcantara JD, Alcantara J. The chiropractic care of patients with cancer: a systematic review of the literature. Integrative Cancer Therapies 2012 Dec;11(4):304-312. 2012. | Narrative review |
| 3 | Alshadwi A, Nadershah M, Carlson ER, Young LS, Burke PA, Daley BJ. Nutritional considerations for head and neck cancer patients: a review of the literature. Journal of oral and maxillofacial surgery : official journal of the American Association of Oral and Maxillofacial Surgeons. 2013;71(11):1853-60. | No relevant outcome |
| 4 | Arnold M, Taylor NF. Does exercise reduce cancer-related fatigue in hospitalised oncology patients? A systematic review. Onkologie 2010 Oct 15;33(11):625-630. 2010. | Intervention not in all studies during cancer treatment |
| 5 | Barbaric M, Brooks E, Moore L, Cheifetz O. Effects of physical activity on cancer survival: a systematic review [with consumer summary]. Physiotherapy Canada 2010 Winter;62(1):25-34. 2010 | Intervention is physical activity (sport, household, etc.) not cancer rehabilitation |
| 6 | Baumann FT, Zopf EM, Bloch W. Clinical exercise interventions in prostate cancer patients--a systematic review of randomized controlled trials. Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer. 2012;20(2):221-33. | No quality appraisal |
| 7 | Beaton R, Pagdin-Friesen W, Robertson C, Vigar C, Watson H, Harris SR. Effects of exercise intervention on persons with metastatic cancer: a systematic review. Physiotherapy Canada 2009 Summer;61(3):141-153. 2009. | Population is not target population |
| 8 | Bicego D, Brown K, Ruddick M, Storey D, Wong C, Harris SR. Effects of exercise on | Intervention not in all studies during cancer treatment |

| | | |
|---|---|---|
| | quality of life in women living with breast cancer: a systematic review. The Breast Journal 2009 Jan-Feb;15(1):45-51. 2009 | |
| 9 | Boehm K, Ostermann T, Milazzo S, Bussing A. Effects of yoga interventions on fatigue: a meta-analysis. Evidence-based complementary and alternative medicine : eCAM. 2012;2012:124703. | Population is not target population |
| 10 | Bourke L, Homer KE, Thaha MA, Steed L, Rosario DJ, Robb KA, et al. Interventions for promoting habitual exercise in people living with and beyond cancer. The Cochrane database of systematic reviews. 2013;9:Cd010192 | Population is not target population |
| 11 | Bradt J, Goodill SW, Dileo C. Dance/movement therapy for improving psychological and physical outcomes in cancer patients. The Cochrane database of systematic reviews. 2011(10):Cd007103. | Population is not target population |
| 12 | Buffart LM, van Uffelen JGZ, Riphagen, II, Brug J, van Mechelen W, Brown WJ, et al. Physical and psychosocial benefits of yoga in cancer patients and survivors, a systematic review and meta-analysis of randomized controlled trials. BMC Cancer 2012 Nov 27;12(559):Epub. 2012 | Population is not target population |
| 13 | Campbell CL, Campbell LC. A systematic review of cognitive behavioral interventions in advanced cancer. Patient education and counseling. 2012;89(1):15-24. | Population is not target population |
| 14 | Carayol M, Bernard P, Boiche J, Riou F, Mercier B, Cousson-Gelie F, et al. Psychological effect of exercise in women with breast cancer receiving adjuvant therapy: what is the optimal dose needed? Annals of oncology : official journal of the European Society for Medical Oncology / ESMO. 2013;24(2):291-300. | Included |
| 15 | Carmichael AR, Daley AJ, Rea DW, Bowden SJ. Physical activity and breast cancer outcome: a brief review of evidence, current practice and future direction. European journal of surgical oncology : the journal of the European Society of Surgical Oncology and the British Association of Surgical Oncology. 2010;36(12):1139-48. | Population is not target population |
| 16 | Cavalheri V, Tahirah F, Nonoyama M, Jenkins S, Hill K. Exercise training undertaken by people within 12 months of lung resection for non-small cell lung cancer. The Cochrane database of systematic reviews. 2013;7:Cd009955. | Population is not target population |
| 17 | Chan CLW, Wang CW, Ho RTH, Ng SM, Chan JSM, Ziea ETC, et al. A systematic review of the effectiveness of Qigong exercise in supportive cancer care. Supportive Care in | Population is not target population |

| | | |
|---|---|---|
| | Cancer 2012 Jun;20(6):1121-1133. 2012 . | |
| 18 | Cheema B, Gaul CA, Lane K, Fiatarone Singh MA. Progressive resistance training in breast cancer: a systematic review of clinical trials. Breast cancer research and treatment. 2008;109(1):9-26. | Population is not target population |
| 19 | Chung C, Lee S, Hwang S, Park E. Systematic review of exercise effects on health outcomes in women with breast cancer. Asian Nursing Research 2013 Sep;7(3):149-159. 2013. | Population is not target population<br>Outcome lymphedema / upper arm morbidity |
| 20 | Cote A, Daneault S. Effect of yoga on patients with cancer: our current understanding [with consumer summary]. Canadian Family Physician 2012 Sep;58(9):e475-e479. 2012. | Population is not target population<br>Control group had intervention |
| 21 | Cramer H, Lange S, Klose P, Paul A, Dobos G. Yoga for breast cancer patients and survivors: a systematic review and meta-analysis. BMC cancer. 2012;12:412. | Outcomes not appropriate |
| 22 | Cramer H, Lauche R, Paul A, Dobos G. Mindfulness-based stress reduction for breast cancer -- a systematic review and meta-analysis. Current Oncology 2012 Oct;19(5):e343-e352. 2012. | Population is not target population |
| 23 | Cramp F, Byron-Daniel J. Exercise for the management of cancer-related fatigue in adults. The Cochrane database of systematic reviews. 2012;11:Cd006145 | Included |
| 24 | Cramp F, Daniel J. Exercise for the management of cancer-related fatigue in adults. The Cochrane database of systematic reviews. 2008(2):Cd006145. | Included |
| 25 | Cramp F, James A, Lambert J. The effects of resistance training on quality of life in cancer: a systematic literature review and meta-analysis. Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer. 2010;18(11):1367-76. | Population is not target population |
| 26 | Duijts SFA, Faber MM, Oldenburg HSA, van Beurden M, Aaronson NK. Effectiveness of behavioral techniques and physical exercise on psychosocial functioning and health-related quality of life in breast cancer patients and survivors -- a meta-analysis. Psycho-Oncology 2011 Feb;20(2):115-126. 2011. | Population is not target population |
| 27 | Faller H, Schuler M, Richard M, Heckl U, Weis J, Kuffner R. Effects of psycho-oncologic interventions on emotional distress and quality of life in adult patients with cancer: systematic review and meta-analysis. Journal of clinical oncology : official journal of the American Society of Clinical Oncology. 2013;31(6):782-93. | Population is not target population |

| | | |
|---|---|---|
| 28 | Focht BC, Clinton SK, Devor ST, Garver MJ, Lucas AR, Thomas-Ahner JM, et al. Resistance exercise interventions during and following cancer treatment: a systematic review. The journal of supportive oncology. 2013;11(2):45-60. | Population is not target population<br>Not a fixed outcome measure |
| 29 | Fors EA, Bertheussen GF, Thune I, Juvet LK, Elvsaas IK, Oldervoll L, et al. Psychosocial interventions as part of breast cancer rehabilitation programs? Results from a systematic review. Psycho-oncology. 2011;20(9):909-18. | Included |
| 30 | Galway K, Black A, Cantwell M, Cardwell Chris R, Mills M, Donnelly M. Psychosocial interventions to improve quality of life and emotional wellbeing for recently diagnosed cancer patients. Cochrane Database of Systematic Reviews [Internet]. 2012; (11) | Included |
| 31 | Gardner JR, Livingston PM, Fraser SF. Effects of exercise on treatment-related adverse effects for patients with prostate cancer receiving androgen-deprivation therapy: a systematic review. Journal of clinical oncology : official journal of the American Society of Clinical Oncology. 2014;32(4):335-46. | Not intervention of interest |
| 32 | Garg S, Yoo J, Winquist E. Nutritional support for head and neck cancer patients receiving radiotherapy: a systematic review. Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer. 2010;18(6):667-77. | No quality appraisal |
| 33 | Goedendorp Martine M, Gielissen Marieke FM, Verhagen Constantijn A, Bleijenberg G. Psychosocial interventions for reducing fatigue during cancer treatment in adults. Cochrane Database of Systematic Reviews [Internet]. 2009; (1). | Population is not target population (curative and palliative and >16) |
| 34 | Graf C, Wessely N. Physical activity in the prevention and therapy of breast cancer. Breast Care. 2010;5(6):389-94. | Not a systematic review |
| 35 | Granger CL, McDonald CF, Berney S, Chao C, Denehy L. Exercise intervention to improve exercise capacity and health related quality of life for patients with Non-small cell lung cancer: a systematic review. Lung cancer (Amsterdam, Netherlands). 2011;72(2):139-53. | Population is not target population (not during cancer treatment) |
| 36 | Harder H, Parlour L, Jenkins V. Randomised controlled trials of yoga interventions for women with breast cancer: a systematic literature review. Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer. 2012;20(12):3055-64 | Population is not target population |
| 37 | Harris SR, Schmitz KH, Campbell KL, McNeely ML. Clinical practice guidelines for breast cancer rehabilitation: syntheses of | Not a systematic review |

| | | |
|---|---|---|
| | guideline recommendations and qualitative appraisals. Cancer. 2012;118(8 Suppl):2312-24. | |
| 38 | Hedgpeth NL. Systematic review of psychosocial interventions for anxiety in adult cancer patients. Pomona, California: Western University of Health Sciences; 2012. | Conference abstract |
| 39 | Jing L. Exercise interventions on health-related quality of life for patients with cancer during active treatment [Health & Mental Health Treatment & Prevention 3300]. US: Oncology Nursing Society US; 2013 [cited 17 Mishra, S. I., Scherer, R. W., Snyder, C., Geigle, P. M., Berlanstein, D. R., & Topaloglu, O. (2012). Exercise interventions on health-related quality of life for people with cancer during active treatment. Cochrane Database of Systematic Reviews, 8, CD008465. doi:10.1002/l4651858.CD 008465.pub2.]. 5:[559-60] | Summary of Mishra |
| 40 | Johannsen M, Farver I, Beck N, Zachariae R. The efficacy of psychosocial intervention for pain in breast cancer patients and survivors: a systematic review and meta-analysis. Breast cancer research and treatment. 2013;138(3):675-90 | Outcome measure not relevant |
| 41 | Jones LW. Evidence-based risk assessment and recommendations for physical activity clearance: cancer. Physiologie Appliquee Nutrition et Metabolisme [Applied Physiology, Nutrition, & Metabolism] 2011 Jul;36(Suppl 1):S101-S112. 2011 | Intervention exercise and exercise testing<br>Outcome: contraindications |
| 42 | Jones LW, Alfano CM. Exercise-oncology research: past, present, and future. Acta Oncologica 2013 Feb;52(2):195-215. 2013 | Summary of Speck / no quality appraisal |
| 43 | Keogh JWL, MacLeod RD. Body composition, physical fitness, functional performance, quality of life, and fatigue benefits of exercise for prostate cancer patients: a systematic review. Journal of Pain and Symptom Management 2012 Jan;43(1):96-110. 2012 | No quality appraisal |
| 44 | Kim CJ, Kang DH, Park JW. A meta-analysis of aerobic exercise interventions for women with breast cancer. Western Journal of Nursing Research 2009 Jun;31(4):437-461. 2009. | No relevant outcome (cardiopulmonary function and body composition) |
| 45 | Kiss NK, Krishnasamy M, Isenring EA. The effect of nutrition intervention in lung cancer patients undergoing chemotherapy and/or radiotherapy: a systematic review. Nutrition and cancer. 2014;66(1):47-56. | Population is not target population |
| 46 | Kruijsen-Jaarsma M, Revesz D, Bierings MB, Buffart LM, Takken T. Effects of exercise on immune function in patients with cancer: a systematic review. Exercise Immunology Review 2013;19:120-143. 2013. | Population is not target population |
| 47 | | No quality appraisal |

| | | |
|---|---|---|
| | Kuchinski AM, Reading M, Lash AA. Treatment-related fatigue and exercise in patients with cancer: a systematic review. Medsurg nursing : official journal of the Academy of Medical-Surgical Nurses. 2009;18(3):174-80. | |
| 48 | Kwekkeboom KL, Cherwin CH, Lee JW, Wanta B. Mind-body treatments for the pain-fatigue-sleep disturbance symptom cluster in persons with cancer. Journal of pain and symptom management. 2010;39(1):126-38. | Population is not target population |
| 49 | Langius JA, Zandbergen MC, Eerenstein SE, van Tulder MW, Leemans CR, Kramer MH, et al. Effect of nutritional interventions on nutritional status, quality of life and mortality in patients with head and neck cancer receiving (chemo)radiotherapy: a systematic review. Clinical nutrition (Edinburgh, Scotland). 2013;32(5):671-8. | Included |
| 50 | Larkin D, Lopez V, Aromataris E. Managing cancer-related fatigue in men with prostate cancer: A systematic review of non-pharmacological interventions. International journal of nursing practice. 2013 | Population is not target population |
| 51 | Lee MS, Ernst E. Systematic reviews of t'ai chi: an overview. British journal of sports medicine. 2012;46(10):713-8. | Population is not target population |
| 52 | Lee MS, Choi TY, Ernst E. Tai Chi for breast cancer patients: a systematic review. Breast Cancer Research and Treatment 2010 Apr;120(2):309-316. 2010. | Population is not target population |
| 53 | Levine AS, Balk JL. Yoga and quality-of-life improvement in patients with breast cancer: a literature review. International journal of yoga therapy. 2012(22):95-9. | Population is not target population |
| 54 | Lin KY, Hu YT, Chang KJ, Lin HF, Tsauo JY. Effects of yoga on psychological health, quality of life, and physical health of patients with cancer: a meta-analysis. Evidence-Based Complementary and Alternative Medicine 2011;(659876):Epub. 2011. | Cancer patients but unclear if during treatment |
| 55 | Liu RD, Chinapaw MJ, Huijgens PC, van Mechelen W. Physical exercise interventions in haematological cancer patients, feasible to conduct but effectiveness to be established: a systematic literature review. Cancer treatment reviews. 2009;35(2):185-92. | Population is not target population. |
| 56 | Maddocks M, Mockett S, Wilcock A. Is exercise an acceptable and practical therapy for people with or cured of cancer? A systematic review. Cancer Treatment Reviews 2009 Jun;35(4):383-390. 2009. | Not answering the question |
| 57 | | Outcomes not relevant |

| | | |
|---|---|---|
| | Markes M, Brockow T, Resch K-L. Exercise for women receiving adjuvant therapy for breast cancer. Cochrane Database of Systematic Reviews [Internet]. 2006; (4). | |
| 58 | Maryam A, Fazlollah A, Eesa M, Ebrahim H, Abbas V-F. The effect of designed exercise programme on quality of life in women with breast cancer receiving chemotherapy [Cancer 3293]. United Kingdom: Wiley-Blackwell Publishing Ltd.United Kingdom; 2010 [cited 24 Promotion & Maintenance of Health & Wellness [3365]]. 2:[251-8]. | A quasi-experimental study |
| 59 | McMillan EM, Newhouse IJ. Exercise is an effective treatment modality for reducing cancer-related fatigue and improving physical capacity in cancer patients and survivors: a meta-analysis. Applied physiology, nutrition, and metabolism = Physiologie appliquee, nutrition et metabolisme. 2011;36(6):892-903 | No quality appraisal |
| 60 | Mishra SI, Scherer RW, Snyder C, Geigle PM, Berlanstein DR, Topaloglu O. Exercise interventions on health-related quality of life for people with cancer during active treatment. The Cochrane database of systematic reviews. 2012;8:Cd008465 | Included |
| 61 | Murphy R, Wassersug R, Dechman G. The role of exercise in managing the adverse effects of androgen deprivation therapy in men with prostate cancer. Physical Therapy Reviews. 2011;16(4):269-77 | No quality appraisal |
| 62 | Mustafa M, Carson-Stevens A, Gillespie D, Edwards Adrian GK. Psychological interventions for women with metastatic breast cancer. Cochrane Database of Systematic Reviews [Internet]. 2013; (6). | Population is not target population |
| 64 | Oh B, Butow P, Mullan B, Hale A, Lee MS, Guo X, et al. A critical review of the effects of medical Qigong on quality of life, immune function, and survival in cancer patients. Integrative cancer therapies. 2012;11(2):101-10. | Population is not target population |
| 65 | Persoon S, Kersten MJ, van der Weiden K, Buffart LM, Nollet F, Brug J, et al. Effects of exercise in patients treated with stem cell transplantation for a hematologic malignancy: a systematic review and meta-analysis. Cancer Treatment Reviews 2013 Oct;39(6):682-690. 2013. | Included |
| 66 | Puetz TW, Herring MP. Differential effects of exercise on cancer-related fatigue during and following treatment: a meta-analysis. American journal of preventive medicine. 2012;43(2):e1-24. | No quality appraisal |
| 67 | Rueda JR, Sola I, Pascual A, Subirana Casacuberta M. Non-invasive interventions for improving well-being and quality of life in patients with lung cancer. The Cochrane database of systematic reviews. | Population is not target population |

| | | |
|---|---|---|
| | 2011(9):Cd004282. | |
| 68 | Sadja J, Mills PJ. Effects of yoga interventions on fatigue in cancer patients and survivors: a systematic review of randomized controlled trials. Explore 2013 Jul-Aug;9(4):232-243. 2013. | Population is not target population |
| 69 | Semple C, Parahoo K, Norman A, McCaughan E, Humphris G, Mills M. Psychosocial interventions for patients with head and neck cancer. The Cochrane database of systematic reviews. 2013;7:CD009441. | Population is not target population |
| 70 | Sharma M, Haider T, Knowlden AP. Yoga as an alternative and complementary treatment for cancer: a systematic review. Journal of alternative and complementary medicine (New York, NY). 2013;19(11):870-5. | Yoga as medical treatment not as additional intervention |
| 71 | Shennan C, Payne S, Fenlon D. What is the evidence for the use of mindfulness-based interventions in cancer care? A review. Psycho-oncology. 2011;20(7):681-97. | Population is not target population |
| 72 | Smith KB, Pukall CF. An evidence-based review of yoga as a complementary intervention for patients with cancer. Psycho-Oncology 2009 May;18(5):465-475. 2009. | Population is not target population |
| 73 | Spark LC, Reeves MM, Fjeldsoe BS, Eakin EG. Physical activity and/or dietary interventions in breast cancer survivors: a systematic review of the maintenance of outcomes [with consumer summary]. Journal of Cancer Survivorship 2013 Mar;7(1):74-82. 2013. | Population is not target population |
| 74 | Stene GB, Helbostad JL, Balstad TR, Riphagen, II, Kaasa S, Oldervoll LM. Effect of physical exercise on muscle mass and strength in cancer patients during treatment--a systematic review. Critical reviews in oncology/hematology. 2013;88(3):573-93. | Outcome is not relevant |
| 75 | van Haren I, Timmerman H, Potting CM, Blijlevens NMA, Staal JB, Nijhuis-van der Sanden MWG. Physical exercise for patients undergoing hematopoietic stem cell transplantation: systematic review and meta-analyses of randomized controlled trials. Physical Therapy 2013 Apr;93(4):514-528. 2013. | Population is not target population |
| 76 | Vanderstraeten E, Vanhoucke J, van Ruymbeke B, Bourgois J. Effecten van fysieke training op de fysieke fitheid, de vermoeidheid en de levenskwaliteit bij borstkankerpatienten: Een literatuuroverzicht (Effects of physical exercise training on physical fitness, fatigue and quality of life in breast cancer patients: literature overview) [Dutch]. Tijdschrift voor Geneeskunde 2011;67(7):317-326. 2011. | Full text on request |
| 77 | | Included |

| | | |
|---|---|---|
| | Velthuis MJ, Agasi-Idenburg SC, Aufdemkampe G, Wittink HM. The effect of physical exercise on cancer-related fatigue during cancer treatment: a meta-analysis of randomised controlled trials. Clinical oncology (Royal College of Radiologists (Great Britain)). 2010;22(3):208-21 | |
| 78 | Velthuis MJ, Agasi-Idenburg SC, van der Wall E, Aufdemkampe G, Wittink HM. Invloed van fysieke training op vermoeidheid tijdens behandeling van kanker; meta-analyse van klinische trials (Physical training to reduce fatigue levels during cancer treatment; a meta-analysis of clinical trials) [Dutch]. Nederlands Tijdschrift voor Geneeskunde 2011;155(45):A3679. 2011 | Included |
| 79 | Vermaete N, Wolter P, Verhoef G, Gosselink R. Physical activity, physical fitness and the effect of exercise training interventions in lymphoma patients: a systematic review. Annals of hematology. 2013;92(8):1007-21. | Outcome is not relevant |
| 80 | Wedlake LJ, Shaw C, Whelan K, Andreyev HJ. Systematic review: the efficacy of nutritional interventions to counteract acute gastrointestinal toxicity during therapeutic pelvic radiotherapy. Alimentary pharmacology & therapeutics. 2013;37(11):1046-56. | Outcome is not relevant |
| 81 | Wiskemann J. Effects of exercise on psychosocial outcomes in patients undergoing hematopoietic stem cell transplantation [Cancer 3293]. Germany: Schattauer Germany; 2012 [cited 9 Health & Mental Health Treatment & Prevention [3300]]. 4:[209-14]. | German article |
| 82 | Wolin KY, Ruiz JR, Tuchman H, Lucia A. Exercise in adult and pediatric hematological cancer survivors: an intervention review. Leukemia 2010 Jun;24(6):1113-1120. 2010. | Population is not target population |
| 83 | Zeng Y, Luo T, Xie H, Huang M, Cheng AS. Health benefits of qigong or tai chi for cancer patients: a systematic review and meta-analyses. Complementary therapies in medicine. 2014;22(1):173-86. | Population is not target population |
| 84 | Zhang J, Yang KH, Tian JH, Wang CM. Effects of yoga on psychologic function and quality of life in women with breast cancer: a meta-analysis of randomized controlled trials. Journal of Alternative & Complementary Medicine 2012 Nov;18(11):994-1002. 2012. | Population is not target population |
| 85 | Zou LY, Yang L, He XL, Sun M, Xu JJ. Effects of aerobic exercise on cancer-related fatigue in breast cancer patients receiving chemotherapy: a meta-analysis. Tumour biology : the journal of the International Society for Oncodevelopmental Biology and Medicine. 2014 | Included |

Table 2, Included studies

| | | |
|---|---|---|
| 1 | Carayol M, Bernard P, Boiche J, Riou F, Mercier B, Cousson-Gelie F, et al. Psychological effect of exercise in women with breast cancer receiving adjuvant therapy: what is the optimal dose needed? Annals of oncology : official journal of the European Society for Medical Oncology / ESMO. 2013;24(2):291-300. | Included |
| 2 | Cramp F, Byron-Daniel J. Exercise for the management of cancer-related fatigue in adults. The Cochrane database of systematic reviews. 2012;11:Cd006145 | Included |
| 2 | Cramp F, Daniel J. Exercise for the management of cancer-related fatigue in adults. The Cochrane database of systematic reviews. 2008(2):Cd006145. | Included, but updated in 2012, see #2 |
| 3 | Fors EA, Bertheussen GF, Thune I, Juvet LK, Elvsaas IK, Oldervoll L, et al. Psychosocial interventions as part of breast cancer rehabilitation programs? Results from a systematic review. Psycho-oncology. 2011;20(9):909-18. | Excluded, no analysis that could be used, RCTs should be included separately |
| 4 | Langius JA, Zandbergen MC, Eerenstein SE, van Tulder MW, Leemans CR, Kramer MH, et al. Effect of nutritional interventions on nutritional status, quality of life and mortality in patients with head and neck cancer receiving (chemo)radiotherapy: a systematic review. Clinical nutrition (Edinburgh, Scotland). 2013;32(5):671-8. | Included |
| 5 | Mishra SI, Scherer RW, Snyder C, Geigle PM, Berlanstein DR, Topaloglu O. Exercise interventions on health-related quality of life for people with cancer during active treatment. The Cochrane database of systematic reviews. 2012;8:Cd008465 | Included |
| 6 | Persoon S, Kersten MJ, van der Weiden K, Buffart LM, Nollet F, Brug J, et al. Effects of exercise in patients treated with stem cell transplantation for a hematologic malignancy: a systematic review and meta-analysis. Cancer Treatment Reviews 2013 Oct;39(6):682-690. 2013. | Included |
| 7 | Velthuis MJ, Agasi-Idenburg SC, Aufdemkampe G, Wittink HM. The effect of physical exercise on cancer-related fatigue during cancer treatment: a meta-analysis of randomised controlled trials. Clinical oncology (Royal College of Radiologists (Great Britain)). 2010;22(3):208-21 | Included |
| 7 | | |

| | | |
|---|---|---|
| | Velthuis MJ, Agasi-Idenburg SC, van der Wall E, Aufdemkampe G, Wittink HM. Invloed van fysieke training op vermoeidheid tijdens behandeling van kanker; meta-analyse van klinische trials (Physical training to reduce fatigue levels during cancer treatment; a meta-analysis of clinical trials) [Dutch]. Nederlands Tijdschrift voor Geneeskunde 2011;155(45):A3679. 2011 | Included, but also published in English see #7 |
| 8 | Zou LY, Yang L, He XL, Sun M, Xu JJ. Effects of aerobic exercise on cancer-related fatigue in breast cancer patients receiving chemotherapy: a meta-analysis. Tumour biology : the journal of the International Society for Oncodevelopmental Biology and Medicine. 2014 | Included |
| 9 | Galway K, Black A, Cantwell M, Cardwell Chris R, Mills M, Donnelly M. Psychosocial interventions to improve quality of life and emotional wellbeing for recently diagnosed cancer patients. Cochrane Database of Systematic Reviews [Internet]. 2012; (11) | Included |

A second search was performed to identify additional randomized controlled trials.

The second search yielded 749 Medline hits, 1253 Embase hits, 274 hits in Psychinfo, 542 hits in Cochrane, 482 hits in CINAHL and 416 hits in PEDRO.
After merging the search files into one file and removal of the duplicates 2174 records were screened on title and abstract. Of these  were excluded. The most important reasons for exclusion was that studies were appendix
Search syntax:

*28. Evidence tables effectiveness rehabilitation*

# 5. Evidence tabel effectiviteit Revalidatie

# QUESTION 1: Are rehabilitation interventions in cancer patients cost-effective?

Multimodal interventions

| Study ID, country | Method & Funding | Patient characteristics | Interventions & variables | Results and sensitiv analysis (S.A.) |
|---|---|---|---|---|
| Bradely et al.[1], England | Clinical data<br>· Design: prospective enriched cohort study. Patients from 3 of 12 hospitals formed IG. Patients from remaining hospitals (i.e.9) formed control group (SC). Matching criteria were: Age, lung function comorbidity and type of surgery<br>· Setting: 12 hospitals<br>· Sample size: 363<br>· Recruitment: Not stated<br>· Data collection: Demographic, clinical and healthcare cost data were collected pre-rehabilitation, post-rehabilitation presurgery, 4 weeks post-surgery and at 6 months.<br><br>Economic evaluation<br>· Type: CBA; using primary clinical data<br>· Perspective: Not stated (applied Healthcare payer)<br>· Cost year & monetary unit: 2010-2011; GBP<br>· Length of evaluation: Not stated (~ 6 months)<br><br>Funding: Nothing indicated | · Cancer type: Patients undergoing curative lung cancer surgery<br>· Eligibility criteria: Patient who was considered fit for curative lung cancer surgery by lung cancer multidisciplinary team at regional thoracic unit and following BTS guidelines. | Interventions: Program to optimize physical status, prepare for inpatient journey and support through recovery after surgery. Includes exercise classes, smoking cessation, dietary advice and patient education[1].<br>· IG: intervention group, n=58 (only 28 managed to attend the postoperative element)<br>· SC: standard care, n=305.<br><br>Program duration: Not stated (~ 6 months)<br><br>Variables included in CEA<br>· Postoperative pulmonary complication; readmission; length of admission, … (expressed in natural units & as costs)<br>· Healthcare costs | Effects:<br>· Patients in IG had Postoperative pulmon complications than SC 16%, p=0.21) and few readmissions (5 vs 14 p=0.12).<br><br>Costs:<br>· Total cost/patient estimated at £1284 co with £1528 for SC.<br><br>Economic evaluation<br>· IG compared to S in savings of £244/pat<br><br>Sensitivity analysis: N |
| Farquhar et al.[2], England | Clinical data<br>· Design: RCT with two arms; randomization by blocks of random size two, four and six, generated by statistician and concealed within sealed opaque envelop until allocation notification by intervention deliverer;<br>· Setting: Community setting<br>· Sample size: 54 (67 allocated)<br>· Recruitment: November 2008-January 2012<br>· Data collection: Baseline (t1: week 1 = before randomization), week 3, week | · Cancer type: Advanced cancer patients<br>· Eligibility criteria: if patients met BIS (Breathlessness Intervention Service) referral criteria (that is, diagnosed appropriately-treated cause of breathlessness, troubled by breathlessness in spite of optimisation of underlying illness, and might benefit | Intervention s: The BIS team comprises: a palliative care medical consultant, a clinical specialist occupational therapist, a clinical specialist physiotherapist and an administrator. At a weekly multidisciplinary team meeting cases are allocated to the most appropriate professional based on information derived from the referral; many patients receive visits from at least two professionals on the team. | Effects:<br>· Patient distress du breathlessness: IG ac sign. greater, reductio compared to CWL: ad difference –1.29 (95% to –0.005), p = 0.049.<br>· Incremental QALY 0.0002 (95%CI: -0.00 for IG vs CWL<br>· No sign. differenc between arms for othe outcomes.<br><br>Costs:<br>· IG had health/soci savings were on avera |

| | | | | |
|---|---|---|---|---|
| | 5. Outcomes measured were: patient distress due to breathlessness using a numerical rating scale, disease-specific health related quality-of-life (Chronic Respiratory Questionnaire: CRQ), and anxiety and depression (Hospital Anxiety and Depression Scale: HADS), EQ-5D and measures of service use (8-weeks and 2-weeks prior to baseline and at week3).<br><br>Economic evaluation<br>· Type: CEA; using primary clinical data<br>· Perspective: Not stated; (results for healthcare & social care)<br>· Cost year & monetary unit: 2011-2012; GBP<br>· Length of evaluation: less than 12-weeks<br><br>Funding: Cambridge University Hospitals' NHS Foundation Trust | from a self-management programme); and not having received BIS previously. | The intervention is delivered predominantly in the home setting with visits lasting 1-1.5 hours. Visits include interventions relevant to that person and formulation of an individually-tailored exercise plan.<br>· IG: intervention group, n=28 (allocated n=35);<br>· CWL, control waiting list, n=26 (allocated n=32). Control had to wait and received intervention after week 3.<br><br>Program duration : 2-weeks<br><br>Variables included in CEA:<br>· Patient distress, anxiety, depression and EQ-5D.<br>· Healthcare costs, including intervention costs.<br>· Informal care costs | compared to CWL (95 -£918 to £310).<br><br>Economic evaluation<br>· Lower health/socia costs and better prima outcome results for IG dominance over CG<br><br>Sensitivity analysis:<br>· One-way S.A. wer performed. Bootstrapp applied<br>· S.A. results confir baseline results |
| Gordon et al.[3],[2] Australia | Clinical data<br>· Design: Decision tree model using effectiveness and clinical data from prospective followed cohorts.<br>· prospective followed cohorts<br>· Setting: 1 university<br>· Sample size: 276<br>· Recruitment: May 2002-July 2003<br>· Data collection: Medical records and self-administered questionnaires (pre-intervention, post-intervention, 6 and 12 months from date of diagnosis), including rehabilitated cases, QALYs and costs<br><br>Economic evaluation:<br>· Type: CEA, using primary clinical data and modelling (decision tree)<br>· Perspective: Societal<br>· Cost year & monetary unit: 2004, AU$<br>· Length of evaluation: 1-year<br><br>Funding: PhD scholarship from | · Cancer type: Breast cancer patients<br>· Eligibility criteria: Women diagnosed with primary breast cancer, had unilateral disease, spoke English, had no cognitive problems and were aged 25-74 years | Interventions: DAART (Domiciliary Allied Health and Acute Care Rehabilitation Team: Home-based physiotherapy and education vs STRETCH (Strength Through Recreation Exercise Togetherness Care Health): group-based exercise, education and psychosocial intervention<br>· DAART, n=36<br>· STRETCH, n=31<br>· SC: standard care, n=208<br><br>Program duration::<br>· DAART: 6 weeks (maximum);<br>· STRETCH: 8 weeks<br><br>Variables included in CEA<br>· Effect variables: Rehabilitated cases, QALYs<br>· Intervention costs, direct healthcare costs, costs borne by patients and productivity losses | Effects:<br>· Proportion of reha cases: similar for STR DAART but slightly hig (not sign. different)<br>· Mean adjusted uti for DAART: 0.84 (95% 0.77-0.90), STRETCH (95%CI: 0.73-0.87) ar 0.72 (95%CI: 0.70-0.7 different.<br><br>Costs:<br>· Total costs/particip $1,038 for STRETCH DAART and $189 for<br><br>Economic evaluation<br>· Rehabilitated case dominant above DAA STRETCH (i.e. more and less costly than th interventions);<br>· QALY: ICER for D STRETCH is AU$1,34 AU$14,478, compared<br><br>Sensitivity analysis:<br>· One-way S.A.; mo did not influence resul |

| | | | | |
|---|---|---|---|---|
| | the National Breast Cancer Foundation and Women in Super | | (leisure time, volunteers, …) | |
| Jones et al.[4], England | Clinical data<br>· Design: Two-arm RCT.<br>· Setting: 1 hospice<br>· Sample size: 36<br>· Recruitment: August 2010-July 2011<br>· Data collection: at baseline and after 3-months. These were: Supportive Care Needs Survey Long Form (SCNS-LF59); Kessler Psychological distress Scale (K10); continuity of Care; EQ5D. Service use was collected retrospectively for 3-months from randomization. Societal and demographic data, diagnosis, and disease severity were collected at baseline.<br><br>Economic evaluation<br>· Type: CUA, using primary clinical data<br>· Perspective: Not stated; NHS perspective (at least this threshold is used)<br>· Cost year & monetary unit: Not stated (trial year:2010-2011); GBP<br>· Length of evaluation: 3-month<br><br>Funding: Marie Curie Cancer Care | · Cancer type: Malignant breast cancer or haematological disease<br>· Eligibility criteria: at the end of treatment for first or subsequent recurrence but not cured; with active, progressive, recurrent malignant breast or haematological disease; older than 18 years and meet pre-set referral criteria (i.e. completed treatment, but advanced, progressive disease and recurrence was likely; required symptom management; had rehabilitation needs not responsive to self-management; had psychological, social, financial, emotional, and spiritual needs not met by the present care); and able to reach the hospice by their own or hospice-based transport. | Interventions included four core components, including systematic clinical assessment; goal setting with review and referrals on a case by case basis, according to needs and weekly meetings [3].<br>· IG: intervention group: n=20 (allocated n=21).<br>· CWL, control waiting list: n=16 (allocated: n=20) ; received usual care (i.e. including ongoing review by oncologists and access to community services including general practitioner (GP), district nurses, social services, and community specialist palliative care), and joined a three-month wait-list for referral to the intervention.<br><br>Program duration: ~3-months with the flexibility of duration<br><br>Variables included in CEA<br>· SCNS psychological domain (primary outcome) and as secondary outcomes: other domains; K10, continuity of care, EQ5D (utility and EQ5D VAS)<br>· QALY<br>· Healthcare utilization (including intervention) & cost | Effects:<br>· IG had greater QA than CWL (mean diffe QALY, 95% CI 0.000-<br>· Primary outcome secondary outcomes significant different at (e.g. IG had sign. lowe for support on the psy subscale of the SCNS CWL (adjusted differe points)). Other signific outcomes included the and patient care subs the SCNS and the sel health state.<br>· Other secondary r all favoured better out the IG, but without sig differences.<br><br>Costs:<br>· IG had higher cos CWL<br><br>Economic evaluation<br>· ICER of £ 19,391 gained. At a WTP of £ £30,000, the intervent expected to be cost-e 55.4% or 73.3% of sim respectively<br><br>Sensitivity analysis:<br>· No on-way sensiti analysis<br>· PSA using Monte sampling techniques |
| Mourgues et al.[5], France | Clinical data<br>· Design: Two-arm, multicenter RCT, stratified by menopausal status.<br>· Setting: 1 university hospital and 2 private hospitals<br>· Sample size: Economic evaluation, n=90; Trial: n=232 [6]<br>· Recruitment: March 2008-October 2010<br>· Data collection: at baseline, 6 and 12 months. Women's activities by calculating separately the total hourly volume of overall activities and occupational and | · Cancer type: Complete breast cancer remission<br>· Eligibility criteria: women in complete breast cancer remission without contraindication for physical activities or cognitive disorders and a body mass index between 18.5 and 40 kg/m2 | Interventions: IG underwent spa treatment (i.e. two week multicomponent programme composed of interventions such as physiotherapy, nutritional advice, thermal water treatment, daily 2-h physical activity, running and basic dietary follow-up over a period of 15 days) combined with consultation with dietician every 6 months;<br>· IG, intervention group, n=42 for CEA (trial n=117) | Effects:<br>· IG had greater res overall activities durin 12-month period vs S (p=0.025).<br>· There was an inte effect (p=0.04) with re resumption of occupa activities: more wome tended to return to wo<br>· Positive effect in t the women's ability to occupation activities 1 after the beginning of (p=0.0014), and on th to perform family activ (p=0.033). |

| | | | | |
|---|---|---|---|---|
| | non-occupational activities (i.e. primary outcome). Daily abilities (= secondary outcome).<br><br>Economic evaluation<br>· Type: CEA; using primary clinical data<br>· Perspective: Societal perspective<br>· Cost year & monetary unit: Not stated; €<br>· Length of evaluation: 1-year<br><br>Funding: French association of thermal centers, the city of Clermont-Ferrand, the regional council of Auvergne and the association "Ligue contre le Cancer" | | [6]<br>· SC, standard care & consultations with the dietician every 6 months, n=48 for CEA (trial n=115) [6]<br><br>Program duration:<br>· 2-week spa treatment & consultation with dietician every 6 months<br><br>Variables included in CEA<br>· Overall activities, occupant and non-occupant activities (and as considered as an effect, productivity losses for absence from paid and unpaid work was not considered)<br>· Intervention costs and direct healthcare costs<br>· Indirect medical costs comprised out-of-pocket expenses associated with the disease and daily allowances. | Costs:<br>· *Not stated*<br><br>Economic evaluation<br>· Overall activities: A thermal treatment was expensive and not cos At T12, the interventio more expensive but a effective.<br>· Occupational activ T6, the thermal treatm too expensive for the increase in effectivene whereas at T12 the in was slightly expensive more effective and the cost-efficient.<br><br>Sensitivity analysis: N |
| Round et al.[7], England [4] | Clinical data, see Jones et al.[4]), and using modelling for extrapolation treatment costs and benefits beyond the initial 3-month follow-up period in S.A.<br><br>Economic evaluation<br>· Type: CUA, using primary clinical data & modelling<br>· Perspective: NHS perspective & a personal social services perspective<br>· Cost year & monetary unit: Not stated (~2010-2011); GBP<br>· Length of evaluation: 3-month (trial), and S.A. assuming that the benefit of treatment being maintained over three, six and nine months beyond completion of the follow-up<br><br>Funding: Marie Curie Cancer Care | · Cancer type: see Jones et al.[4]<br>· Eligibility criteria: see Jones et al.[4] | Interventions: see Jones et al.[4].<br><br>Program duration: see Jones et al.[4]<br><br>Variables included in CEA<br>· QALY<br>· Intervention costs and direct healthcare costs | Effects:<br>· At 3-months (i.e. t the mean differences was 0.052 (95%CI: 0.<br><br>Costs:<br>· At 3-months (i.e. t period), the expected differences in costs in base-case analysis wa (95%CI: £221 to £1,27<br><br>Economic evaluation<br>· ICER of the mean incremental values is per QALY gained<br><br>Sensitivity analysis:<br>· One-way S.A. and<br>· The results of the are sensitive to the m to estimate QALYs;<br>· 'The longer treatm is maintained, the mo becomes that the inte represents a cost-effe of resources' |
| Mewes et al. [8], the | Clinical data:<br>· Design: Markov model | · Cancer type: Breast cancer | Interventions: Comparing cognitive behavioural | Effects:<br>· Total QALY gain w |

| | | | | |
|---|---|---|---|---|
| Netherlands | consisting of four health states: "menopausal symptoms", "reduction in menopausal symptoms", "recurrence" and "death", using effectiveness and clinical data came from a 4-arm RCT of Duijts et al.[9, 10], n=420 randomly allocated using computerized block randomization [11]<br>· Setting/sample size: Hypothetical cohort of 1,000 women of 48 years. Trial (multi-center)<br>· Recruitment: N.A.<br>· Data input: Effectiveness data mainly based on RCT published by Duijts et al.[10], but extrapolated up to 5 years<br><br>Economic evaluation<br>· Type: CEA; using model<br>· Perspective: Dutch healthcare system perspective<br>· Cost year & monetary unit: Not stated; €<br>· Length of evaluation: Base-case: 6-month; S.A.: 1.5, 3 and 5 years, discounting effects with 1.5% and costs with 4% according to Dutch guidelines<br><br>Funding: Alpe d'Huzes, a foundation that is part of the Dutch Cancer Society | patients experience (severe) menopausal symptoms after an early onset of menopause caused by cancer treatment<br>· *Eligibility criteria*: Hypothetical cohort of 1,000 patients with a starting age of 48 years and starting in the Markov health state “menopausal symptoms” | therapy (CBT) vs physical exercise (PE)[5].<br>In the original trial[10], sample size per arm was:<br>· CBT, n=109<br>· PE, n=104<br>· CWL: control waiting list: n=103.<br><br>Program duration:<br>· CBT intervention involved six weekly groups sessions of 90 min each.[10]<br>· PE intervention consisted of a 12-week home-based exercise program, individually tailored during an intake session with a physiotherapist. [10]<br><br>Variables modelled & included in CEA<br>· Deriving QALY, by using SF36 from the trial and converting to EQ5D values<br>· Intervention costs, healthcare utilization & cost, | across the interventio and higher than CWL<br><br>Costs:<br>· The costs of the interventions were €1 and €197 for PE<br><br>Economic evaluation<br>· ICURs indicate tha likely the most cost-ef treatment, followed by compared to WLC<br><br>Sensitivity analysis:<br>· One-way S.A. and<br>· At a ceiling ratio o €30,000/QALY, the in would no longer be co cost-effective when th of treatment effect is 3 years. |

Exercise interventions

| **Study ID, country** | **Method & Funding** | **Patient characteristics** | **Interventions & variables** | **Results and se analysis (S.A.)** |
|---|---|---|---|---|
| Haines et al.[12], Australia | Clinical data<br>· Design: RCT with blinded outcome assessment and concurrent economic evaluation. Randomization using a computer-generated randomization sequence.<br>· Setting: 1 hospital<br>· Sample size: 73<br>· Recruitment: May 2006-September 2007<br>· Data collection: Medical records and self-administered questionnaires and log-book at baseline, 3 and 6 months, assessing demographic data (baseline), clinical, qol and cost data, and 12-month telephone | · Cancer type: Breast cancer patients<br>· Eligibility criteria: Women with newly diagnosed breast cancer undergoing adjuvant therapy (following surgery) ; no severe cardiac disease; no uncontrolled hypertension or orthopaedic injury precluding participation in an exercise program. | Interventions: Multimedia physical activity program consisting of home-based strength, balance, shoulder mobility, and cardiovascular endurance program<br>· IG: intervention group, n=37<br>· CG: control group, n=36 receiving an active intervention of flexibility and relaxation exercises.<br><br>Program duration: Not indicated<br><br>Variables included in CEA<br>· EQ-5D VAS and EQ-5D (i.e. QALYs), EORT C30<br>· Intervention costs, direct | Effects:<br>· Value-based gained per patie 0.03 (full datase (outliers exclude comparing IG vs<br>· Utility-based were -0.01 (full d and zero (outlier excluded) compa CG.<br><br>Costs:<br>· Total cost we and CG 3,864 A 3,594 AU$ (p=0. respectively. Or outliers 3,290 ar |

| | | | | |
|---|---|---|---|---|
| | follow-up assessing EQ5D.<br><br>Economic evaluation<br>· Type: CEA, using primary clinical data<br>· Perspective: Societal<br>· Cost year & monetary unit: 2006; AU$<br>· Length of evaluation: 6-month time horizon<br><br>Funding: Project grant from the Princess Alexandra Hospital cancer Collaborative Group | | healthcare costs and productivity losses from paid and unpaid work | (p=0.61), respec<br><br>Economic evalu<br>· WTP would AU$484,884 (ful or AU$340,391 excluded)<br>· This program appear to be an economically eff program to impr women with brea<br><br>Sensitivity analy<br>· One-way S.A excluding outlier<br>· PSA using bootstrapping te |
| Retel et al. [13], the Netherlands | Clinical data<br>· Design: Markov model with three mutually exclusive health states: “complete remission”, “recurrent disease” and “death” using data from two RCT. Data for usual care (SC) were derived from a multi-center RCT comparing intra-arterial and intervenous chemo radiation in advanced head and neck cancer [14] and data for a preventive (swallowing) exercise program (PREPP) were derived from a clinical trial conducted immediately following the former RCT [15]<br>· Setting/sample size: Hypothetical cohort of 1,000 patients of 55 years<br>· Recruitment: N.A.<br>· Data input: Based on the two RCTs (i.e. [14, 15]) and literature<br><br>Economic evaluation<br>· Type: CUA, using modelling<br>· Perspective: Healthcare perspective<br>· Cost year & monetary unit: 2008; €<br>· Length of evaluation: 1-year time horizon<br><br>Funding: Nothing stated | · Cancer type: Head and neck cancer patients.<br>· *Eligibility criteria*: Hypothetical cohort of patients aged 55 years and starting with treatment | Interventions: Preventive (swallowing) exercise program. In the original trial:<br>· PREEP (i.e. intervention group), n=37<br>· SC, standard care, n=43<br><br>Program duration: Not stated<br><br>Variables included in CEA<br>· QALYs partly based on trial, literature and expert elicitation<br>· Intervention costs and direct healthcare costs | Effects:<br>· QALY: 0.77 vs 0.68 (SC)<br><br>Costs:<br>· Total health (Treatment + pre exercise) /patien €42,271 for PRE €41,986 for SC<br><br>Economic evalu<br>· ICER of PRE compared to SC per QALY gaine<br><br>Sensitivity analy<br>· One-way an S.A.<br>· Majority of a resulted in an ICER<€20,000 p |

Psychosocial interventions

| Study ID, country | Method & Funding | Patient characteristics | Interventions & variables | Results and se analysis (S.A.) |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Arving et al. [16], Sweden | Clinical data<br>· Design: RCT with three groups; randomization in blocks[17],<br>· Setting: 1 university hospital<br>· Sample size: n=168<br>· Recruitment: December 1997-December 1999<br>· Data collection: Demographic and medical data were retrieved from patient files. Health utilities were measured at baseline and at 1, 3,6, 9, 12 and 24 months<br><br>Economic evaluation:<br>· Type: CUA using primary clinical data;<br>· Perspective: British National Health Service perspective:<br>· Cost year & monetary unit: 2004; €<br>· Length of evaluation: 2-years (no discounting applied)<br><br>Funding: Swedish Cancer Society | · Cancer type: Breast cancer patients starting adjuvant therapy<br>· Eligibility criteria: Breast cancer patients starting adjuvant therapy; ability to speak and understand Swedish; no previous cancer; no on-going psychiatric illness | Interventions took place outside the hospital, face-to-face or over the telephone, and started in median 20 days after inclusion. They were similar and used the same techniques such as relaxation, distraction, activity scheduling, and ways to improve communication, methods derived from cognitive behavioural therapy [18]<br>· INS: Psychosocial support from a specially trained nurse, n=55<br>· IPS: Psychosocial support from a psychologist, n=57<br>· SC: Standard care, n=56.<br><br>Program duration::<br>· INS: 0-16 sessions (median=2); if ≥1 session: mean (median) duration being 172 (106) days.<br>· IPS: 0-23 sessions (median=3); if ≥1 session: mean (median) duration being 210 (178) days.<br><br>Variables included in analysis:<br>· Health utilities using the EORTC QLQ-C30 translated into the EQ-5D<br>· Intervention costs (including salary, a direct hospital component and an indirect allocation (i.e. supervision).<br>· Healthcare utilization during 2 years using medical records. | Effects:<br>· QALY was h INP-group (1.59 compared with I (1.52) and SC-g (1.43).<br><br>Costs:<br>· Costs (intervention+DH €18,670 for INS, for IPS and for S €25,800.<br><br>Economic evalua<br>· INS and IPS dominant compa (i.e. INS and IPS higher effect (i.e and lower costs comparison to S<br><br>Sensitivity analy<br>· Several one- performed and b results confirme<br>· Bootstrappin 1,000 replication estimate 95%CI |
| Björnekl et al.[19], Sweden | Clinical data<br>· Design: RCT with two groups; randomization in blocks of four with closed envelops<br>· Setting: 1 hospital<br>· Sample size: 382<br>· Recruitment: April 2002-November 2007<br>· Data collection: Self-reported questionnaires at baseline (i.e. after randomization but before intervention), 2, 6 and 12-months after intervention. Family situation, occupation, sick leave and healthcare utilization<br><br>Economic evaluation<br>· Type: CBA; using primary clinical data | · Cancer type: Breast cancer.<br>· Eligibility criteria: Newly diagnosed primary breast cancer, no previous malignancy, the physical and mental capability to participate in group interventions and to fill in questionnaires and an expected survival time of more than 12 months. | Intervention Information-based support program supplemented with relaxation, qi-gong and liberating dance taking place within 4-months of ending treatment; comprising a 7-day stay at a resort, where participants take part in the support program, followed by a 4-day follow-up 2-months after the initial visit.<br>· IG: Intervention group, n=191<br>· SC: Standard care, n=191<br><br>Program duration: ~2.5 months<br><br>Variables included in CEA<br>· Sick leave of patient (number of days & expressed as costs (i.e. productivity losses))<br>· Health care utilization | Effects:<br>· No sign. diffe between the gro neither for sick le the number of vi medical specialis time after the int period.<br><br>Costs:<br>· At all points higher costs for and consumptio services for IG th and sign. differe between groups 12-months. Addi cost of the interv made the cost fo statistically signi higher at all time measurement. |

| | | | | |
|---|---|---|---|---|
| | · Perspective: Societal<br>· Cost year & monetary unit: Not stated (trial period); SEK<br>· Length of evaluation: 1-year<br><br>Funding: Country Council of Västmanland, the Swedisch Social Insurance Agency, the Västmanland Research Fund against Cancer and the National Federation of Cancer and Traffic Injury | | (expressed in natural units & as costs) | Economic evalua<br>· SC is domina compared to IG. difference in effe between groups higher costs for<br><br>Sensitivity analy |
| Hollingworth et al.[19], England | Clinical data<br>· Design: Unblinded, two-arm, parallel RCT, stratified by recruitment site.<br>· Setting: community-setting (2 sites)<br>· Sample size: 209 analyzed (220 allocated)<br>· Recruitment: October 2009-February 2011<br>· Data collection: At baseline and 1, 6 and 12-months. These were: Short-form of the Profile of Mood States (POMS), EORTC QLQ-C30; EQ5D; Trent Patient Views of Cancer Services Questionnaires (only at 6-months). Further healthcare utilization via medical records and intervention costs<br><br>Economic evaluation<br>· Type: CEA and NMB (using £30,000 per QALY); using primary clinical dataWTP using a threshold of £30,000 per QALY<br>· Perspective: National Health Service perspective<br>· Cost year & monetary unit: 2010-2011, GBP<br>· Length of evaluation: 1-year<br><br>Funding: National Institute for Health Research, Research for Patient Benefit | · Cancer type: Patients starting outpatient radiotherapy or chemotherapy.<br>· Eligibility criteria:Age ≥18 and less than 85 years; primary solid tumor diagnosis within previous 12 months; outpatient external radiotherapy over a period of ≥2 weeks or outpatient chemotherapy of ≥two cylces; ability to read and communicate in English; not receiving neoadjuvant chemotherapy; and not diagnosed with ductal carcinoma in situ or skin carcinoma | Interventions: During 2nd week of radiotherapy/2nd cycle of chemotherapy, patients completed a face-to-face DT&PL meeting with a radiographer/nurse. A second DT&PL meeting could be arranged toward the end of therapy. The DT&PL forms the basis of a therapeutic conversation where concerns are identified and potential solutions are discussed including immediate staff actions (e.g. providing information), patient actions (e.g. using a self-help resource), and referral (e.g. psychological counselling). These action plans were recorded.<br>· IG: intervention group (allocated: n=112; included in intent-to-treat, n=106)<br>· SC; standard care (allocated: n=108; included in intent-to-treat, n=103).<br><br>Program duration:<br>· 2 meetings<br><br>Variables included in CEA<br>· EQ5D (i.e. QALY)<br>· Intervention costs and direct healthcare costs | Effects:<br>· There was n of an interventio the total POMS s 12-months or ov 12-month follow-<br>· Also no sign for QALY or any secondary outco<br><br>Costs:<br>· The interven £19 per patient, not offset by low subsequent hosp primary care or r costs<br><br>Economic evalua<br>· NBM was £2 IG and £22,255 with Δ-915 (95% -2,398-569). The difference in net indicates that the intervention was cost-effective.<br><br>Sensitivity analy<br>· Subgroup ar |
| Lemieux et al.[20], Canada | Clinical data<br>· Design: Blind two-arm RCT, stratified by center and the presence or absence of visceral metastases.<br>· Setting: 7 centers (but only 3 of the 7 for the economic evaluation)<br>· Sample size: economic analysis using only patients from 3-sites; n=125 | · Cancer type: Breast cancer patients.<br>· Eligibility criteria: Women who had histologic confirmation of breast cancer at the time of diagnosis, if they had metastases outside of the breast | Interventions: Weekly, 90-minute, therapist-led support group that adhered to principles of supportive-expressive (SE) therapy. Every four to six months, all the women received educational materials about breast cancer and its treatment, as well as about relaxation and nutrition.<br>· IG: intervention group, n=43 | Effects:<br>· No significan difference betwe groups in surviva<br>· Statistically s benefits were fou psychological dis (0.32 for POMS- pain (0.40 PAIN- the 1st year. |

| | | | | |
|---|---|---|---|---|
| | · Recruitment: 1993-1998<br>· Data collection: at base line, 4, 8, and 12 months, using psychosocial questionnaires that included the Profile of Mood States and the pain and suffering scales used by Spiegel and Bloom and the EORTC QLQ-C30. Further, information on demographic characteristics and social support.[2]<br><br>Economic evaluation<br>· Type: CMA (for primary outcome) and CEA for mood and pain; using primary clinical data<br>· Perspective: Healthcare system<br>· Cost year & monetary unit: 2002-2003; CAN$<br>· Length of evaluation: Not stated, ~1-year (i.e. effect is measured at one-year, although length of follow-up is 722 days (IG) and 750 days (SC))<br><br>Funding: Canadian Institute of Health Research and the Canadian Breast Cancer Research Alliance. | and ipsilateral axilla, and if the treating physician most responsible for a woman's care gave consent[2] | · SC: standard care & educational materials, n=82;<br><br>Program duration: Attending the group sessions for at least one year, or longer if the sessions continued to be of benefit<br><br>Variables included in CEA<br>· Survival (primary outcome)<br>· Secondary outcomes: psychosocial functioning, mood, pain,<br>· Intervention costs and direct healthcare costs | Costs:<br>· The control<br>$2,169<br>· The mean co<br>per patient was<br>and $31,715 in<br>respectively.<br><br>Economic evalua<br>· CMA: Differe<br>between both ar<br>equal to $3,526<br>significant), and<br>intervention cost<br>$2,169), there w<br>statistically signi<br>difference in res<br>costs between I<br>· CEA: increm<br>are CAN$5,550<br>CAN$4,309 for a<br>size of change i<br>and pain, respec<br><br>Sensitivity analy<br>· One- way S.<br>change in result |
| Mandelblatt et al.[21], USA | Clinical data<br>· Design: Three-arm RCT, stratified by study site, whether the woman had received chemotherapy, and marital status (married/living as married v other); randomization based on a random number-generated list.<br>· Setting: 3 sites<br>· Sample size: 388<br>· Recruitment: July 1999-June 2002<br>· Data collection: At baseline, 2-months (~4 to 6 weeks) after primary treatment; and at 6 and 12 months after intervention, using IES-R and MOS-SF36. Further included the baseline demographic and clinical data, the 2-month asses if in the IG women had watched the videotape. Further, every 3 months documenting health services. Research staff used weekly logs to record time and | · Cancer type: Breast cancer patients<br>· Eligibility criteria: Women who had received surgery for invasive breast cancer of any size or nodal status, and who had no neoadjuvant chemotherapy, high-dose chemotherapy with bone marrow or stem-cell rescue or protracted reconstructive surgery, and who were able to read and write in English | Interventions:: Videotape intervention and printed information (VID) vs psychological educational counselling , videotape and printed information (EDU)<br>· VID, n=128<br>· EDU, n=135<br>· SC, standard care & printed information, n=125.<br><br>Program duration:<br>· VID: not stated<br>· EDU: 2 sessions, the first 80-minutes and the 2nd 2 weeks later by phone, 30-minutes<br><br>Variables included in CEA<br>· Distress and energy 6 months postintervention, using IES-R and MOS-SF36 vitality scale<br>· Intervention costs, healthcare utilization and patients time cost | Effects:<br>· EDU was no<br>effective in incre<br>energy or decrea<br>distress than the<br>arms.<br><br>Costs:<br>· Intervention<br>$11.30 for SC; $<br>VID and $134.47<br>· No significan<br>differences in he<br>costs over the 1<br>post-intervention<br>study arm.<br><br>Economic evalua<br>· EDU was no<br>effective than th<br>others, but more<br>expensive, thus<br>by the two other<br>· ICER for VID<br>was $7,275 per<br>decreased distre<br>$2.22 per unit |

| | | | | |
|---|---|---|---|---|
| | resources used to deliver intervention.<br><br>Economic evaluation<br>· Type: CEA; using primary clinical data<br>· Perspective: Societal perspective<br>· Cost year & monetary unit: Not stated (~2002); US$<br>· Length of evaluation: 6-month *'because this is the period of immediate transition and by 12 months, most women have adjusted to survivorship*'[21]<br><br>Funding: National Cancer Institute | | | improvement in<br>respectively<br><br>Sensitivity analy<br>· One-way S.<br>· No change c |
| Sabariego et al. [22], Germany | Clinical data<br>· Design: Two-arm RCT, randomization by code[23][6]<br>· Setting: 2 rehabilitation clinics<br>· Sample size: 174<br>· Recruitment: November 2002-December 2003<br>· Data collection: at baseline, post-intervention and at the 3- and 12-month follow-up after discharge, including costs, SF12, standardized Fear of Progression Questionnaire<br><br>Economic evaluation<br>· Type: CEA; using primary clinical data<br>· Perspective: Societal perspective was stated; collected data for a societal perspective, but CEA was only conducted using direct (medical & non-medical) cost 'as only 52.8% and 42.2% of participants were still in the work force'<br>· Cost year & monetary unit: 2004; €<br>· Length of evaluation: 6-months<br><br>Funding: German Federal Ministry of Education and Research and the German Pension Insurance Administration | · Cancer type: Breast, colon, and cervical cancer patients<br>· Eligibility criteria: Breast, colon or cervical (at all illness phases), minimum age of 18 years, inpatient rehabilitation and increased fear of progression measured with the standardized Fear of Progression Questionnaire | Interventions: Standard inpatient rehabilitation program plus four session of group psychotherapy, each lasting 90 min. Cognitive-behavioural group therapy (CBT) a directive and specific intervention aimed at confronting patients with their fears and making them learn to cope with them; vs Client-centred, supportive-experiential group therapy (SET), a non-directive and unspecific intervention focussing on emotional expression, mutual support and reassurance, and social comparison (SET)<br>· CBT, n=91.<br>· SET, n=83<br><br>Program duration:<br>· 3-week inpatient rehabilitation<br><br>Variables included in CEA<br>· Fear of progression and quality of life<br>· Intervention cost and direct healthcare costs<br>· Indirect cost were calculated based on sick leave days, using the human capital approach<br>· Direct non-medical costs included: loss of leisure time of patients due to participation in self-help groups and of parents or friends due to voluntary caregiving. | Effects:<br>· Fear of prog score: Mean sco baseline was 11 11.02 and at 12- 10.07 and 9.73 i and the SET gro respectively.<br>· For the ment the SF12: Mean baseline was 38 37.3 and at 12-m and 42.6 in the C the SET groups, respectively.<br><br>Costs:<br>· CBT had few cost than SET, b differences were significant.<br><br>Economic evalua<br>· CBT is slight effective and les with an ICER of for an additional effect of fear of progression;<br>· ICER for qua was -€16,976, su CBT has similar and fewer costs<br><br>Sensitivity analy<br>· No one-way using bootstrapp model 95%CI. |
| Tamminga et al.[24], the | Clinical data<br>· Design: Two-arm RCT, | · Cancer type: Breast and | Interventions: included: 1) 4 meetings of 15 minutes each as | Effects:<br>· Study failed |

| | | | | |
|---|---|---|---|---|
| Netherlands | randomization using computerized randomization program ALEA; stratified by return-to-work, age (<50 or ≥50 years) and cancer diagnosis. Patients, nurses and researchers are not blind to group assignment.<br>· Setting: 6 hospitals<br>· Sample size: 121 analyzed (133 allocated)<br>· Recruitment: May 2009-December 2010<br>· Data collection: At baseline, 6 and 12-month. Socio-demographic factors and prognostic factors for time until return-to-work were assessed at baseline only. Oucome measures (e.g. return-to-work and qol) and cancer treatments were assessed at all-time points. Intervention details were collected from nurses.<br><br>Economic evaluation<br>· Type: CMA (no CEA as no sign. differences between groups on outcomes measured); using primary clinical data<br>· Perspective: Societal<br>· Cost year & monetary unit: Not stated; €<br>· Length of evaluation: for economic evaluation, only first year follow-up<br><br>Funding: Stichting Instituut Gak | gynaecological cancer<br>· Eligibility criteria: Cancer patients between 18 and 60 years of age who had been treated with curative intent, had paid work, who were on sick leave; were able to speak, read and write Dutch, had no severe mental disorder or other severe comorbidity. Treatment with curative intent was defined as an expected 1-year survival rate of approximately 80%. We excluded patients who were not sufficiently able to speak, read, or write Dutch, had a severe mental disorder or other severe comorbidity, and for whom the primary diagnosis of cancer had been made more than two months previously. | part of the normal consulting hour to start early vocational rehabilitation carried out by an oncology nurse, social worker or nurse practitioner; 2) one meeting with the participant, the occupational physician, and the supervisor to make a return-to-work plan, and 3) three letters send to the occupational physician to enhance communication; two will be from the treating physician and one from the nurse.<br>· IG, intervention group, n=61 analyzed (65 allocated)<br>· SC, standard care, n=60 analyzed (68 allocated).<br><br>Program duration: Not stated<br><br>Variables included in CEA<br>· Rate of return-to work at one year of follow-up<br>· Number of days between the first day of sick leave and the first day at work sustained for at least 4 weeks.<br>· Qol using SF-36, including all subscales and VAS.<br>· Work ability using the first question of WAI.<br>· Impaired work functioning using WLQ<br>· Intervention costs<br>· Lost productivity costs and work adjustments costs<br>· *No healthcare utilization* | any significant d between groups return-to-work ou and qol.<br><br>Costs:<br>· Intervention €119/patient in I<br>· The mean lo productivity cost to the human ca approach was €4 IG and €38,968 mean productivit according to the costs approach v €14,030 in IG ar in SC.<br>· The mean w accommodations €2,975 and €3,0 and SC, respect<br>· These costs differ statistically groups<br><br>Economic evalua<br>· No statistica effect and costs groups.<br><br>Sensitivity analy applied |

Abbreviations: CBA=cost-benefit analysis; CEA=cost-effectiveness analysis; CMA=cost-minimization analysis (i.e. no sign. difference in non-monetary effect measured, all other effects expressed in monetary units); CUA=cost-utility analysis; CG=control group (= standard care & additional rehabilitation measures); CWL=control waiting list; DHC=direct healthcare costs (i.e. cost for healthcare utilization); EORTC QLQ-C30= questionnaire developed to assess the quality of life of cancer patients by the European Organization for Research and Treatment of Cancer; EQ5D=Euroqol EQ-5D; IES-R=Revised Impact of Events Scale; IG=intervention group; : K10=Kessler Psychological distress Scale (K10); MOS-SF36= Medical Outcomes Study (MOS) Short-Form (SF) 36; PSA= probabilistic sensitivity analysis; RCT=randomized clinical trial; S.A.=sensitivity-analysis; SC=standard care group; SCNS/SCNS-LF59=Supportive Care Needs Survey Long Form (SCNS-LF59); QALY=Quality-adjusted life years; Qol=quality-of-life; VAS=Visual Analogue Scale; WAI= Work ability Index; WLQ=Work Limitation Questionnaire

**References**

1. Bradley, A., et al., *Pulmonary rehabilitation programme for patients undergoing curative lung cancer surgery.* Eur J Cardiothorac Surg, 2013. **44**(4): p. e266-71.
2. Farquhar, M.C., et al., *Is a specialist breathlessness service more effective and cost-effective for patients with advanced cancer and their carers than standard care? Findings of a mixed-method randomised controlled trial.* BMC Med, 2014. **12**(1): p. 194.
3. Gordon, L.G., et al., *A cost-effectiveness analysis of two rehabilitation support services for women with breast cancer.* Breast Cancer Res Treat, 2005. **94**(2): p. 123-33.
4. Jones, L., et al., *Rehabilitation in advanced, progressive, recurrent cancer: a randomized controlled trial.* J Pain Symptom Manage, 2013. **46**(3): p. 315-325 e3.
5. Mourgues, C., et al., *Positive and cost-effectiveness effect of spa therapy on the resumption of occupational and non-occupational activities in women in breast cancer remission: a French multicentre randomised controlled trial.* Eur J Oncol Nurs, 2014. **18**(5): p. 505-11.
6. Kwiatkowski, F., et al., *Long term improved quality of life by a 2-week group physical and educational intervention shortly after breast cancer chemotherapy completion. Results of the 'Programme of Accompanying women after breast Cancer treatment completion in Thermal resorts' (PACThe) randomised clinical trial of 251 patients.* Eur J Cancer, 2013. **49**(7): p. 1530-8.
7. Round, J., B. Leurent, and L. Jones, *A cost-utility analysis of a rehabilitation service for people living with and beyond cancer.* BMC Health Serv Res, 2014. **14**(1): p. 558.
8. Mewes, J.C., et al., *Cost-effectiveness of cognitive behavioral therapy and physical exercise for alleviating treatment-induced menopausal symptoms in breast cancer patients.* J Cancer Surviv, 2014.
9. Hollingworth, W., et al., *Are needs assessments cost effective in reducing distress among patients with cancer? A randomized controlled trial using the Distress Thermometer and Problem List.* J Clin Oncol, 2013. **31**(29): p. 3631-8.
10. Drummond, M.F., et al., *Methods for the Economic Evaluation of Health Care Programs*2005, Oxford, UK: Oxford University Press.
11. Duijts, S.F., et al., *Efficacy of cognitive behavioral therapy and physical exercise in alleviating treatment-induced menopausal symptoms in patients with breast cancer: results of a randomized, controlled, multicenter trial.* J Clin Oncol, 2012. **30**(33): p. 4124-33.
12. Haines, T.P., et al., *Multimodal exercise improves quality of life of women being treated for breast cancer, but at what cost? Randomized trial with economic evaluation.* Breast Cancer Res Treat, 2010. **124**(1): p. 163-75.
13. Retel, V.P., et al., *A cost-effectiveness analysis of a preventive exercise program for patients with advanced head and neck cancer treated with concomitant chemo-radiotherapy.* BMC Cancer, 2011. **11**: p. 475.
14. Ackerstaff, A.H., et al., *First-year quality of life assessment of an intra-arterial (RADPLAT) versus intravenous chemoradiation phase III trial.* Head Neck, 2009. **31**(1): p. 77-84.
15. van der Molen, L., et al., *A randomized preventive rehabilitation trial in advanced head and neck cancer patients treated with chemoradiotherapy: feasibility, compliance, and short-term effects.* Dysphagia, 2011. **26**(2): p. 155-70.
16. Arving, C., et al., *Cost-utility analysis of individual psychosocial support interventions for breast cancer patients in a randomized controlled study.* Psychooncology, 2014. **23**(3): p. 251-8.
17. Arving, C., et al., *Individual psychosocial support for breast cancer patients: a randomized study of nurse versus psychologist interventions and standard care.* Cancer Nurs, 2007. **30**(3): p. E10-9.
18. Arving, C., et al., *Satisfaction, utilisation and perceived benefit of individual psychosocial support for breast cancer patients--a randomised study of nurse versus psychologist interventions.* Patient Educ Couns, 2006. **62**(2): p. 235-43.
19. Bjorneklett, H.G., et al., *A randomized controlled trial of support group intervention after breast cancer treatment: results on sick leave, health care utilization and health economy.* Acta Oncol, 2013. **52**(1): p. 38-47.
20. Lemieux, J., et al., *Economic analysis of psychosocial group therapy in women with metastatic breast cancer.* Breast Cancer Res Treat, 2006. **100**(2): p. 183-90.
21. Mandelblatt, J.S., et al., *Economic evaluation alongside a clinical trial of psycho-educational interventions to improve adjustment to survivorship among patients with breast cancer.* J Clin Oncol, 2008. **26**(10): p. 1684-90.
22. Sabariego, C., et al., *Cost-effectiveness of cognitive-behavioral group therapy for dysfunctional fear of progression in cancer patients.* Eur J Health Econ, 2011. **12**(5): p. 489-97.

23. Herschbach, P., et al., *Evaluation of two group therapies to reduce fear of progression in cancer patients.* Support Care Cancer, 2010. **18**(4): p. 471-9.
24. Tamminga, S.J., et al., *Effectiveness of a hospital-based work support intervention for female cancer patients - a multi-centre randomised controlled trial.* PLoS One, 2013. **8**(5): p. e63271.

[1] Educations sessions were delivered by lung cancer nurse specialists and physiotherapists, whereby addressing the diet, smoking, lifestyle change, disease process and diagnosis, inpatient expectations, preparation for discharge and home, pain management, basics of breathing and benefits of mobility, coughing and airway clearance as well as ways of dealing with symptoms while outside the hospital. Exercises: Patient attended local COPD rehabilitation exercise class twice weekly for 1 h, which included a combination of endurance and strength exercises as well as inspiratory muscle exercises. The patients in the intervention group trained up to 60% of their maximum exercise capacity guided by the BORG scale of breathlessness. The PRP was pragmatic in nature, permitting a degree of local adaptation. The exercise classes were delivered in hospital in two centers and in the community in one center, using individualized programs in two centers and group classes in the other. Postoperatively: Between 4 and 6 weeks post-hospital discharge, the intervention group rejoined the rehabilitation program twice weekly for up to 3 months and was then offered maintenance sessions once a week. All smokers were accelerated into locally available smoking cessation pathways. These included smoking advice, counselling and nicotine replacement therapy as appropriate. All patients had dietary advice by lung cancer nurse and a nutritional assessment, which included body mass index (BMI) as well as history of weight loss. If they met the criteria for dietary intervention (BMI <20, or 10% weight loss in the last 3 months), the patients were referred to a Macmillian dietician and received preoperative nutritional drink supplements, which continued for up to 3 months based on the subsequent postoperative nutritional assessment.
[2] CEA was already included in the 2010 literature review.
[3] Four core components were defined: 1.) Systematic clinical assessment (symptoms and treatments) by senior medical and nursing staff using the National Assessment and Care Planning Framework; 2.) Goal setting with the review date agreed between patient and clinician; referrals within the MDT on a case-by-case basis according to current need, for example, physical (exercise), psychological, and complementary therapies, comprising therapies such as: Art therapy; Bach flower remedies; counselling; social work; writing therapy; acupuncture; healing; homeopathy; hypnotherapy; Indian head message; relaxation group; reiki (simple form of healing); massage; physiotherapy/hydrotherapy; reflexology; Dietician/Nutritional therapy; 3.). Weekly MDT meeting to review patients, raise problems, and discuss offering additional available services according to individual need and preference; 4.) Patient/clinical discussion in clinics according to goal-setting timetable to review progress, set new goals, or agree on a discharge date.
[4] Round et al [7] and Jones et al. [4] is the same trial. Jones et al. presented the trial, effectiveness results and a first economic evaluation. The main objective of the Round paper was the economic evaluation. They perform probabilistic sensitivity analysis and scenario analyses whereby modelling also a longer follow-up period. Round and colleagues present detailed results of the economic evaluation.
[5] In the original trial presented in Duijts et al.[9,10] there were three intervention groups, namely CBT, PE and a combination of both (CBT+PE) vs CWL. But given that the combined CBT+PE treatment had no additional patient benefit above CBT or PE, and would always be more costly, this treatment option was not considered in the economic analysis by Mewes et al. [8]

[6] Herschbach et al.[23] had an RCT with 2-arms, and 1 year later a control group (but collected for the control group only information on the primary outcome (i.e. Fear of Progression).

*29. Evidence tables work*

# 6. Evidence tabel arbeid

# Vraag 2: Effect van interventies gericht op arbeid

Systematic reviews

| Study ID | Method | Patient characteristics | Intervention(s) | Results |
|---|---|---|---|---|
| de Boer 2011 | · SR + MA<br>· Funding/CoI:<br>o Coronel Institute of Occupational Health, Netherlands.<br>o Cochrane Occupational Safety and Health Review Group, Finland.<br>o University of Birmingham, UK.<br>o Uniformed Services University of the Health Sciences, USA.<br>o SIG Pathways to Work. University Research Programme, Netherlands.<br>o Finnish Work Environment Fund, Finland.<br>o No CoI known<br>· Search date: Feb 2010<br>· Databases: CENTRAL, Medline, Embase, Cinahl, OSH-ROM, PsycInfo, DARE, ClinicalTrials.gov, Trialregister.nl, Controlled-trials.com<br>· Study designs: RCTs, quasi-RCTs, cluster-RCTs, controlled before-after studies (CBAs)<br>· N included studies: 14 RCTs and 4 CBAs | · Eligibility criteria: adults (18+) with cancer and were in paid employment (employee or self-employed) at the time of diagnosis; all cancer types<br>· Patient characteristics:<br>o N=1652<br>o Breast cancer: 8 studies; prostate cancer: 3 studies | Any type of intervention with the aim to enhance return-to-work:<br>· Psychological<br>· Vocational<br>· Physical<br>· Multidisciplinary<br><br>vs.<br><br>Usual care | **Diversionary activities** (critical): N reported<br><br>**Physical activity** (critical): see Qu of life<br><br>**Self-efficacy** (critical): Not reporte<br><br>**Cognitive functioning** (critical): s Quality of life<br><br>**Job satisfaction** (critical): not rep<br><br>**Job loss** (critical): not reported<br><br>**(Partial) return to work** (importan<br>· Psychological interventions:<br>o 2 RCTs (Lepore 2003): RR = 1.2 95%CI 0.96-1.51<br>o 3 CBAs (Capone 1980, Gordon 1980): RR = 1.52, 95%CI 1.19-1.9<br>· Vocational interventions: no evidence<br>· Physical interventions (1 RCT: Rogers 2009, physical training programme): OR = 1.20, 95%CI 0.32-4.54<br>· Multidisciplinary interventions ( RCTs: Berglund 1994, Burgio 200 Maguire 1983): RR = 1.15, 95%CI 1.01-1.30<br><br>**Quality of life** (important):<br>· Psychological interventions:<br>o 2 RCTs (Lepore 2003):<br>§ Physical functioning: MD = 1.43, 95%CI -0.71 to 3.57<br>§ Mental functioning: MD = 0.14, 9 -1.62 to 1.91<br>· Vocational interventions: no evidence<br>· Physical interventions (1 RCT: Rogers 2009, physical training programme): MD = -4.60, 95%CI - to 2.79<br>· Multidisciplinary interventions ( RCT: Berglund 1994): MD = -0.07, 95%CI -0.33 to 0.19<br><br>**Fatigue** (important): Not reported |
| Egan 2013 | · SR<br>· Funding/CoI: funded by the | · Eligibility criteria: adults (18+) that survived cancer | Treatments that could be provided by rehabilitation professions | **Narrative presentation of results de Boer 2011 and Tamminga 201 See evidence report** |

| | | | | |
|---|---|---|---|---|
| | Canadian Institutes of Health Research (Grant # KPE-117820) and the Bruyère Research Institute; CoI not reported<br>· Search date: Jan 2000 - Jan 2012<br>· Databases: PubMed, Embase, Cinahl, PsycInfo, RehabDATA<br>· Study designs: SR, RCTs<br>· N included studies: unclear | · Patient characteristics:<br>o Not reported in detail | | |
| Tamminga 2010 | · SR<br>· Funding/CoI: granted by the Stichting Insituut GAK (SIG); no CoI<br>· Search date: Oct 2008<br>· Databases: PubMed, Embase, Cinahl, PsycInfo<br>· Study designs: all<br>· N included studies: 23 | · Eligibility criteria: adults (18+) diagnosed with cancer<br>· Patient characteristics:<br>o Mean age 48y<br>o Mainly breast cancer | Interventions aiming at the improvement of return to work, employment status, or work retention through improvement of work-environment-related or person-related factors | **Diversionary activities** (critical): n reported<br><br>**Physical activity** (critical): not rep<br><br>**Self-efficacy** (critical): not reporte<br><br>**Job satisfaction** (critical): not rep<br><br>**Job loss** (critical): not reported<br><br>**Cognitive functioning** (critical): n reported<br><br>**(Partial) return to work** (importan studies (of which 4 controlled trials<br>· Rate of return-to-work in intervention group: range 37-89%, median 76%<br>· Controlled trials (N=4):<br>o Capone 1980: OR 0.24, 95%CI 0.06-1.02<br>o Maguire 1983: OR 0.37, 95%CI 0.15-0.93<br>o Berglund 1993: OR 3.50 (0.65-1<br>o Berglund 1994: OR 0.63 (0.27-1<br><br>**Quality of life** (important): not rep<br><br>**Fatigue** (important): not reported |

Primaire studies

| Study ID | Method | Patient characteristics | Interventions | Results |
|---|---|---|---|---|
| Björneklett 2013 | · Design: RCT<br>· Funding/CoI: the County<br>· Council of Västmanland, the Swedish Social Insurance Agency, the Västmanland | · Eligibility criteria: women with newly diagnosed primary breast cancer, no previous malignancy, the physical and mental capability to participate in group interventions and to fill in | Support-intervention program (N=191):<br>· information-based support program supplemented with relaxation, qi-gong and liberating dance<br>· within 4 months of | **Physical activity** (critical): not reported<br><br>**Job satisfaction** (critical): not reported<br><br>**Job loss** (critical): not reported |

| | | | | |
|---|---|---|---|---|
| | Research Fund against Cancer and the National Federation of Cancer and Traffic Injury; no CoI<br>· Setting: single centre, Sweden<br>· Sample size: N=382<br>· Duration: recruitment April 2002 – Nov 2007 | questionnaires and an expected survival time of more than 12 months; patients with a physical disability were excluded, as were patients with severe visual or hearing impairments, serious mental illness, dementia or active alcohol abuse, and patients who had participated in group rehabilitations<br>· *A priori* patient characteristics:<br>o Age: 30-84y<br>o Breast-conserving surgery N=293, mastectomy N=89<br>o No between-group differences | ending adjuvant treatment<br>· on a residential basis for one week, followed by four days of follow-up two months later<br><br>vs.<br><br>Routine control group (N=191) | **Self-efficacy** (critical): not report<br><br>**Return to work** (critical): not reported<br>Surrogate outcomes:<br>· Sick leave: no significant differences at 2 (44.3% vs. 45.7% p=0.853), 6 (36.2% vs. 32.6%, p=0.599) and 12 months (27.1% 25.3%, p=0.783)<br><br>**Quality of life** (critical): not repo |
| Hubbard 2013<br>Kyle 2011 | · Design: RCT<br>· Funding/CoI: Macmillan Cancer Support and Scottish Centre for Healthy Working Lives; no CoI<br>· Setting: 3 NHS hospitals, Scotland<br>· Sample size: N=22<br>· Duration: recruitment Sep 2010 – Dec 2011; follow-up 12 months | · Eligibility criteria: women with invasive breast cancer or DCIS first treated with surgery; 18-65y; paid employment or self-employed; living or working in Lothian or Tayside, Scotland, UK<br>· *A priori* patient characteristics:<br>o Mean age 50.5y<br>o Stage II: 44.4%<br>o Full-time employment: 61.1%<br>o Mean number of hours worked: 32.5 hours/week | Vocational rehabilitation service (Working Health Services, WHS) (N=8):<br>· telephone contacts with case manager<br>· face-to-face meeting with case manager<br>· referral to other service<br><br>vs.<br><br>Usual care (N=14) | **Physical activity** (critical): FACT physical well-being subscale, me (SD)<br>· 6 months: 23.1 (3.9) vs. 21.9 (6.5); MD = 1.2, 95%CI -7.2 to 4. p=0.68<br>· 12 months: 25.0 (1.4) vs. 23 (5.2); MD = 1.2, 95%CI -5.6 to 3. p=0.56<br><br>**Job satisfaction** (critical): not reported<br><br>**Job loss** (critical):<br>· All participants had the same role at 12 months as they had reported before their cancer diagnosis<br><br>**Self-efficacy** (critical): not report<br><br>**Return to work** (critical): not reported<br>Surrogate outcomes:<br>· Sick leave at 6 months: MD 53.1, 95%CI 15.8 to 122.0, p=0<br>· Sick leave at 12 months: MD 2.0, 95%CI 3.4 to 7.3, p=0.441<br><br>**Quality of life** (critical): FACT-B scale, mean (SD)<br>· 6 months: 109.0 (17.9) vs. 9 (21.4); MD = 10.1, 95%CI -31.7 t 11.5, p=0.333<br>· 12 months: 113.7 (18.5) vs. 107.1 (19.8); MD = 6.6, 95%CI -2 to 14.2, p=0.51 |

| | | | | |
|---|---|---|---|---|
| Sherman 2012 | · Design: RCT<br>· Funding/CoI: not reported<br>· Setting: 3 major medical centers and 1 community hospital, US<br>· Sample size: N=249<br>· Duration: unclear | · Eligibility criteria: women with confirmed diagnosis of early-stage breast cancer; no previous history of cancer; who had identified a person most intimately involved in the breast cancer experience who was named their “partner”; no concurrent, uncontrolled, chronic medical illness; no history of psychiatric hospitalization or drug abuse<br>· *A priori* patient characteristics:<br>o Mean age 53.8y<br>o Full time employment: 52.8% | Group 1: usual care<br><br>vs.<br><br>Group 2: usual care + four phase-specific psychoeducational videos: (a) Coping With Your Diagnosis, (b) Recovering From Surgery, (c) Understanding Adjuvant Therapy, and (d) Your Ongoing Recovery<br><br>vs.<br><br>Group 3: usual care + telephone counseling intervention<br><br>vs.<br><br>Group 4: usual care + phase-specific psychoeducational videotapes and telephone counseling | **Diversionary activities** (critical) reported<br><br>**Physical activity** (critical): not reported<br><br>**Self-efficacy** (critical): not report<br><br>**Cognitive functioning** (critical): reported<br><br>**(Partial) return to work** (importa not reported<br>Surrogate outcomes:<br>· Vocational well-being (subsc of PAIS): significant main effect f time (p=0.024), but no significant group or group x time interaction<br><br>**Quality of life** (important): not reported<br><br>**Fatigue** (important): not reported |
| Tamminga 2013 | · Design: RCT<br>· Funding/CoI: Stichting Insituut Gak; no CoI related to topic<br>· Setting: 6 centres, the Netherlands<br>· Sample size: N=133<br>· Duration: recruitment May 2009 – Dec 2010<br>o Follow-up: 12 months | · Eligibility criteria: cancer patients 18-60y who had been treated with curative intent (expected 1-year survival rate of approximately 80%); exclusion of patients who were not sufficiently able to speak, read, or write Dutch, had a severe mental disorder or other severe comorbidity, and for whom the primary diagnosis of cancer had been made more than two months previously<br>· *A priori* patient characteristics:<br>o Mean age: 47.5 vs. 47.6y<br>o Female: 99% vs. 100%<br>o Breast cancer: 64% vs. 60% | Hospital-based work support intervention: patient education and support at the hospital and improvement of communication between treating and occupational physicians; gradual return-to-work plan (N=65)<br><br>vs.<br><br>Usual care (N=68) | **Physical activity** (critical):<br>· SF-36, physical functioning subscale at 12m: 81 vs. 79, p=0.<br><br>**Job satisfaction** (critical): not reported<br><br>**Job loss** (critical):<br>· 4/65 vs. 5/68<br><br>**Self-efficacy** (critical): not report<br><br>**Return to work** (critical):<br>· At 12m: 79% in both groups (p=0.97); RR = 1.03 (95%CI 0.84-1.2)<br>· HR for partial return-to-work 1.03 (95%CI 0.64-1.6)<br>· HR for full return-to-work: 0. (95%CI 0.53-1.5)<br><br>**Quality of life** (critical):<br>· No significant differences between groups:<br>o VAS at 12m: 73 vs. 70, p=0.26 |

o SF-36: no differences on subsc

Abbreviations: 95%CI: 95% confidence interval; CoI: conflicts of interest; RCT: randomized controlled trial; SR: systematic review

**References**

de Boer AG, Taskila T, Tamminga SJ, Frings-Dresen MH, Feuerstein M, Verbeek JH. Interventions to enhance return-to-work for cancer patients. Cochrane Database of Systematic Reviews. 2011;2(2):CD007569.

Egan MY, McEwen S, Sikora L, Chasen M, Fitch M, Eldred S. Rehabilitation following cancer treatment. Disability & Rehabilitation. 2013;35(26):2245-58.

Tamminga SJ, de Boer AGEM, Verbeek JHAM, Frings-Dresen MHW. Return-to-work interventions integrated into cancer care: a systematic review. Occup Environ Med. 2010;67(9):639-48.

Bjorneklett HG, Rosenblad A, Lindemalm C, Ojutkangas M-L, Letocha H, Strang P, et al. A randomized controlled trial of support group intervention after breast cancer treatment: results on sick leave, health care utilization and health economy. Acta Oncol. 2013;52(1):38-47.

Hubbard G, Gray NM, Ayansina D, Evans JMM, Kyle RG. Case management vocational rehabilitation for women with breast cancer after surgery: a feasibility study incorporating a pilot randomised controlled trial. Trials [Electronic Resource]. 2013;14(175).
Sherman DW, Haber J, Hoskins CN, Budin WC, Maislin G, Shukla S, et al. The effects of psychoeducation and telephone counseling on the adjustment of women with early-stage breast cancer. Applied Nursing Research. 2012;25(1):3-16.

Tamminga SJ, Verbeek JHAM, Bos MMEM, Fons G, Kitzen JJEM, Plaisier PW, et al. Effectiveness of a hospital-based work support intervention for female cancer patients - a multi-centre randomised controlled trial. PLoS ONE [Electronic Resource]. 2013;8(5):e63271.

*30. Literature search work*

# 1. Key question

*Wat is het effect van ondersteuning / adviezen / (verpleegkundige )interventies gericht op arbeid bij (A) tijdens of (B) na afloop van de in opzet curatieve behandeling van kanker op deelname aan het arbeidsproces, kwaliteit van leven, zinvolle dagbesteding , vermoeidheid, cognitief functioneren?*
P: patiënten met kanker (A) tijdens of (B) na afloop van de in opzet curatieve behandeling van kanker (radiotherapie, chemotherapie, immunotherapie)
I: ondersteuning / adviezen / (verpleegkundige )interventies gericht op arbeid/terugkeer naar werk
C: reguliere zorg
O: deelname aan het arbeidsproces, kwaliteit van leven, zinvolle dagbesteding , vermoeidheid, cognitief functioneren, maatschappelijke participatie

# 2. Search strategy

Search date: February 20, 2014.
Databases: OVID Medline, Embase and the Cochrane Library (see appendix for search strings).
Search limits:

- Publication date: 2008-2014;
- English and Dutch only;

- Study design: meta-analyses, systematic reviews, RCTs.

# 3. Search Results

**Table 3. Overall search results.**

| **Database** | **Number of hits** |
|---|---|
| OVID Medline | 937 |
| OVID PreMedline | 54 |
| EMBASE.com | 352 |
| Cochrane Database of Systematic Reviews | 49 |
| DARE | 1 |
| HTA database | 2 |
| CENTRAL | 563 |
| Cinahl | 38 |
| PsycInfo | 54 |
| **Total hits** | **2050** |
| N excluded (language, year, duplicates) | 817 |
| **Total unique eligible hits** | **1233** |

## a. Excluded studies

1233 unique hits were screened on title and abstract (Table 3). Of these, 1605 were excluded. The most important reasons for exclusion were:

1. Other population: patients without cancers
2. Other intervention: interventions other than those specified
3. Wrong study design: narrative reviews, observational studies

Of the remaining 40 papers, the full-text was retrieved. Based on the full-text, an additional 33 studies were excluded. Table 4 provides an overview of these excluded studies.

## b. Included studies

The following 3 systematic reviews were included:

- de Boer AG, Taskila T, Tamminga SJ, Frings-Dresen MH, Feuerstein M, Verbeek JH. Interventions to enhance return-to-work for cancer patients. Cochrane Database of Systematic Reviews. 2011;2(2):CD007569.
- Egan MY, McEwen S, Sikora L, Chasen M, Fitch M, Eldred S. Rehabilitation following cancer treatment. Disability & Rehabilitation. 2013;35(26):2245-58.

- Tamminga SJ, de Boer AGEM, Verbeek JHAM, Frings-Dresen MHW. Return-to-work interventions integrated into cancer care: a systematic review. Occup Environ Med. 2010;67(9):639-48.

The following 4 primary studies were included:

- Bjorneklett HG, Rosenblad A, Lindemalm C, Ojutkangas M-L, Letocha H, Strang P, et al. A randomized controlled trial of support group intervention after breast cancer treatment: results on sick leave, health care utilization and health economy. Acta Oncol. 2013;52(1):38-47.
- Hubbard G, Gray NM, Ayansina D, Evans JMM, Kyle RG. Case management vocational rehabilitation for women with breast cancer after surgery: a feasibility study incorporating a pilot randomised controlled trial. Trials [Electronic Resource]. 2013;14(175).
- Sherman DW, Haber J, Hoskins CN, Budin WC, Maislin G, Shukla S, et al. The effects of psychoeducation and telephone counseling on the adjustment of women with early-stage breast cancer. Applied Nursing Research. 2012;25(1):3-16.

- Tamminga SJ, Verbeek JHAM, Bos MMEM, Fons G, Kitzen JJEM, Plaisier PW, et al. Effectiveness of a hospital-based work support intervention for female cancer patients - a multi-centre randomised controlled trial. PLoS ONE [Electronic Resource]. 2013;8(5):e63271.

**Table 4. Key question 2: overview of excluded studies based on full-text evaluation.**

| Author | Reference | Title | Re |
|---|---|---|---|
| Amir Z | Occup Med (Oxf) 2009 59(6):373-7 | Cancer survivorship and employment: epidemiology | Na |
| Brocki BC | Lung Cancer 2014 83(1):102-8 | Short and long-term effects of supervised versus unsupervised exercise training on health-related quality of life and functional outcomes following lung cancer surgery - A randomized controlled trial | Ge op |
| Buffart LM | Cancer Treat. Rev. 2014 40(2):327-340 | Evidence-based physical activity guidelines for cancer survivors: Current guidelines, knowledge gaps and future research directions | Ov gu |
| de Boer AGEM | Occup Med (Oxf) 2009 59(6):378-80 | Employment and the common cancers: return to work of cancer survivors | Na |
| de Boer AGEM | JAMA 2009 301(7):753-62 | Cancer survivors and unemployment: a meta-analysis and meta-regression | Ga we |
| De Boer AGM | Cochrane Database Syst. Rev. 2009 1): | Interventions to enhance return-to-work for cancer patients | Up 20 |
| Duijts SFA | Psycho-Oncology 2013 | Physical and psychosocial problems in cancer survivors beyond return to work: A systematic review | Re ps pr wo |
| Farley Short P | JAMA 2009 302(1):33; author reply 34-5 | Employment status among cancer survivors | Le |
| Feuerstein M | J 2010 4(4):415-37 | Work in cancer survivors: a model for practice and research | Ge int |
| Franco G | Med Lav 2013 104(2):87-92 | Occupation and breast cancer: fitness for work is an aspect that needs to be addressed | Na |
| Gudbergsson | Minerva Psichiatr. 2008 | Aspects of the work situation of cancer survivors | Ni |

| | | | |
|---|---|---|---|
| SB | 49(1):45-60 | | |
| Hegel MT | Psycho-Oncology 2011 20(10):1092-1101 | Feasibility study of a randomized controlled trial of a telephone-delivered problem-solving-occupational therapy intervention to reduce participation restrictions in rural breast cancer survivors undergoing chemotherapy | Is ha |
| Horsboel TA | Eur J Cancer Care (Engl) 2012 21(4):424-35 | Factors associated with work outcome for survivors from haematological malignancies--a systematic literature review | Ge int |
| Hoving JL | BMC Cancer 2009 9(117): | Return to work of breast cancer survivors: a systematic review of intervention studies | Ge kw ge |
| Juvet LK | Database of Abstracts of Reviews of Effects 2009 1):1 | Rehabilitation of breast cancer patients: systematic review (Provisional abstract) | No |
| Khan F | Cochrane Database of Systematic Reviews 2013 1): | Multidisciplinary rehabilitation after primary brain tumour treatment | Te |
| Kyle RG | Trials [Electronic Resource] 2011 12(89): | Vocational rehabilitation services for patients with cancer: design of a feasibility study incorporating a pilot randomised controlled trial among women with breast cancer following surgery | De 20 |
| Mak AKY | Journal of Occupational Rehabilitation 2011 21(1): | Toward an occupational rehabilitation policy community for cancer survivors in Singapore: a stakeholder perspective from the SME employers | Na |
| Martin TA | JBI Database Syst. Rev. Implement. Rep. 2013 11(9):258-309 | Effectiveness of individualized survivorship care plans on quality of life of adult female breast cancer survivors: A systematic review | Ge op |
| Mehnert A | Crit Rev Oncol Hematol 2011 77(2):109-30 | Employment and work-related issues in cancer survivors | Ge int |
| Mehnert A | Cancer 2013 11(2151-9 | Employment challenges for cancer survivors | Na |
| Munir F | Occup Med (Oxf) 2009 59(6):381-9 | Employment and the common cancers: correlates of work ability during or following cancer treatment | Ge int |
| Silver JK | Am J Phys Med Rehabil 2011 90(5 Suppl 1):S5-15 | Cancer rehabilitation with a focus on evidence-based outpatient physical and occupational therapy interventions | Na |
| Silver JK | WORK 2013 46(4):455-72 | Cancer rehabilitation may improve function in survivors and decrease the economic burden of cancer to individuals and society | Na |
| Steiner JF | Psychooncology 2010 19(2):115-24 | Returning to work after cancer: quantitative studies and prototypical narratives | Ge int |
| Stigt JA | J. Thorac. Oncol. 2013 8(2):214-221 | A randomized controlled trial of postthoracotomy pulmonary rehabilitation in patients with resectable lung cancer | Ge op |
| Tamminga SJ | J Occup Rehabil 2012 22(4):565-78 | A hospital-based work support intervention to enhance the return to work of cancer patients: a process evaluation | Ev ee |
| Tamminga SJ | BMC Cancer 2010 10(345): | Enhancing return-to-work in cancer patients, development of an intervention and design of a randomised controlled trial | Stu |
| Tiedtke C | Psychooncology 2010 19(7):677-83 | Experiences and concerns about 'returning to work' for women breast cancer survivors: a literature review | Nie ma |
| van Dalen EC | JAMA 2009 302(1):33-4; author reply 34-5 | Employment status among cancer survivors | Le |
| van Muijen P | Eur J Cancer Care (Engl) 2013 22(2):144-60 | Predictors of return to work and employment in cancer survivors: a systematic review | Re pro |
| Wells M | Psychooncology 2013 22(6):1208-19 | Supporting 'work-related goals' rather than 'return to work' after cancer? A systematic review and meta-synthesis of 25 qualitative studies | Ge int |
| Zhang X | Cancer Nurs 2013 36(1):4-5 | Cochrane review summary for cancer nursing: interventions to enhance return to work for cancer patients | Be Co Bo |

# Search strings Question 1

## 1. medline (ovid)

1 exp "Patient Acceptance of Health Care"/ (159633)
2 Patient Dropouts/ (6469)
3 complian*.ti,ab. (79272)
4 comply*.ti,ab. (7923)
5 complied.ti,ab. (2692)
6 adher*.ti,ab. (106198)
7 noncomplian*.ti,ab. (5802)
8 nonadher*.ti,ab. (5840)
9 uptake.ti,ab. (235728)
10 (patient adj dropout*).ti,ab. (144)
11 (treatment* adj refusal*).ti,ab. (219)
12 (patient adj participation).ti,ab. (1153)
13 (patient adj acceptance).ti,ab. (2050)
14 maintenance.ti,ab. (172295)
15 variance*.ti,ab. (103492)
16 or/1-15 (821663)
17 Attitude to Health/ or Attitude/ or attitude.ti,ab. (130855)
18 motivation/ or "aspirations (psychology)"/ or drive/ or exploratory behavior/ or goals/ or intention/ or exp personality/ (272618)
19 personality.ti,ab. (49492)
20 behavio?r.ti,ab. (452604)
21 "Social Determinants of Health"/ (46)
22 determinant*.ti,ab. (151108)
23 risk factors/ (543003)
24 exp Socioeconomic Factors/ (329278)
25 predictor*.ti,ab. (187802)
26 social support/ (49664)
27 or/17-26 (1829337)
28 exercise/ or physical conditioning, human/ or resistance training/ or exp running/ or swimming/ or walking/ or exp physical endurance/ or physical fitness/ (133314)
29 exercise movement techniques/ or exercise therapy/ (25219)
30 Movement/ (57861)
31 exp Sports/ (123692)
32 exp "Physical Education and Training"/ (13241)
33 (physical$ adj (active or activity or activities)).ti,ab. (51727)
34 ((MUSCLE or MUSCLES) adj STRENGTHEN$).ti,ab. (461)
35 (SWIM$ or JOG$ or RUN or RUNNING or WALK or WALKING).ti,ab. (154990)
36 ((CIRCUIT$ or RESISTANCE or STRENGTH$ or PHYSICAL or WEIGHT) adj (TRAIN or TRAINING)).ti,ab. (9920)
37 exercise$.ti,ab. (178609)
38 (sport or sports).ti,ab. (33684)
39 aerobic$.ti,ab. (51281)
40 Diet/ or Diet Therapy/ (114787)
41 Nutrition Policy/ or Nutrition Therapy/ (6735)
42 Food Habits/ (20015)
43 (diet or diets or dieta* or diete* or dieti* or nutrition* or food habit* or feeding behavio?r* or eating behavio?r*).ti,ab. (441506)
44 exp Smoking/dt, pc, th [Drug Therapy, Prevention & Control, Therapy] (16352)
45 exp "Tobacco Use Cessation"/ (19909)
46 "Tobacco Use"/pc [Prevention & Control] (5)
47 smoking cessation.ti,ab. (14028)
48 alcohol*.ti,ab. (209186)
49 (binge or drink*).ti,ab. (90807)
50 alcoholism.ti,ab. (23460)
51 exp Drinking Behavior/ (55217)

52 alcohol-related disorders/ or alcoholic intoxication/ or binge drinking/ (13959)
53 exp Body Weight/ (337807)
54 (body adj (weight or mass)).ti,ab. (231700)
55 exp Body Mass Index/ (75735)
56 (body mass index or bmi).ti,ab. (112728)
57 or/28-56 (1607477)
58 exp Neoplasms/ (2500226)
59 Neoplasm Staging/ (117868)
60 cancer$.ti,ab. (977619)
61 tumor$.ti,ab. (894871)
62 tumour$.ti,ab. (191122)
63 carcinoma$.ti,ab. (440172)
64 neoplasm$.ti,ab. (91896)
65 lymphoma.ti,ab. (105058)
66 melanoma.ti,ab. (71051)
67 staging.ti,ab. (47126)
68 metastas$.ti,ab. (204235)
69 metastatic.ti,ab. (130906)
70 exp Neoplasm Metastasis/ (152159)
71 exp neoplastic processes/ (324767)
72 neoplastic process$.ti,ab. (2232)
73 non small cell.ti,ab. (28473)
74 adenocarcinoma$.ti,ab. (89573)
75 squamous cell.ti,ab. (61763)
76 nsclc.ti,ab. (16326)
77 osteosarcoma$.ti,ab. (14066)
78 phyllodes.ti,ab. (1236)
79 cystosarcoma$.ti,ab. (550)
80 fibroadenoma$.ti,ab. (2852)
81 (non adj small adj cell).ti,ab. (28473)
82 (non adj2 small adj2 cell).ti,ab. (28676)
83 (nonsmall adj2 cell).ti,ab. (1675)
84 plasmacytoma$.ti,ab. (5100)
85 myeloma.ti,ab. (34460)
86 multiple myeloma.ti,ab. (22219)
87 lymphoblastoma$.ti,ab. (258)
88 lymphocytoma$.ti,ab. (262)
89 lymphosarcoma$.ti,ab. (3589)
90 immunocytoma.ti,ab. (401)
91 sarcoma$.ti,ab. (68681)
92 hodgkin$.ti,ab. (49979)
93 (nonhodgkin$ or non hodgkin$).ti,ab. (28698)
94 or/58-93 (2879101)
95 16 and 27 and 57 and 94 (1646)
96 limit 95 to yr="2008 - 2014" (740)

## 2. PreMedline (OVID)

97 complian*.ti,ab. (5839)
98 comply*.ti,ab. (653)
99 complied.ti,ab. (193)
100 adher*.ti,ab. (8530)
101 noncomplian*.ti,ab. (350)
102 nonadher*.ti,ab. (399)
103 uptake.ti,ab. (15519)
104 (patient adj dropout*).ti,ab. (7)
105 (treatment* adj refusal*).ti,ab. (10)
106 (patient adj participation).ti,ab. (100)
107 (patient adj acceptance).ti,ab. (112)
108 maintenance.ti,ab. (11790)

109 variance*.ti,ab. (10666)
110 or/97-109 (51895)
111 attitude.ti,ab. (2386)
112 (motivation or aspiration* or drive or goal* or intention*).ti,ab. (32896)
113 personality.ti,ab. (3335)
114 behavio?r.ti,ab. (68045)
115 determinant*.ti,ab. (8752)
116 risk factor*.ti,ab. (25613)
117 socioeconomic.ti,ab. (3559)
118 predictor*.ti,ab. (16066)
119 social support.ti,ab. (1603)
120 or/111-119 (148731)
121 (physical$ adj (active or activity or activities)).ti,ab. (5548)
122 ((MUSCLE or MUSCLES) adj STRENGTHEN$).ti,ab. (66)
123 (SWIM$ or JOG$ or RUN or RUNNING or WALK or WALKING).ti,ab. (15925)
124 ((CIRCUIT$ or RESISTANCE or STRENGTH$ or PHYSICAL or WEIGHT) adj (TRAIN or TRAINING)).ti,ab. (901)
125 exercise$.ti,ab. (12803)
126 (sport or sports).ti,ab. (4194)
127 aerobic$.ti,ab. (4763)
128 (diet or diets or dieta* or diete* or dieti* or nutrition* or food habit* or feeding behavio?r* or eating behavio?r*).ti,ab. (31337)
129 smoking cessation.ti,ab. (1127)
130 alcohol*.ti,ab. (18816)
131 (binge or drink*).ti,ab. (6138)
132 alcoholism.ti,ab. (917)
133 (body adj (weight or mass)).ti,ab. (16899)
134 (body mass index or bmi).ti,ab. (11875)
135 or/121-134 (99865)
136 neoplasm*.ti,ab. (5465)
137 cancer$.ti,ab. (73743)
138 tumor$.ti,ab. (53329)
139 tumour$.ti,ab. (11056)
140 carcinoma$.ti,ab. (24735)
141 neoplasm$.ti,ab. (5465)
142 lymphoma.ti,ab. (5446)
143 melanoma.ti,ab. (3660)
144 staging.ti,ab. (3178)
145 metastas$.ti,ab. (14682)
146 metastatic.ti,ab. (9555)
147 neoplastic process$.ti,ab. (109)
148 non small cell.ti,ab. (3096)
149 adenocarcinoma$.ti,ab. (5660)
150 squamous cell.ti,ab. (4340)
151 nsclc.ti,ab. (2195)
152 osteosarcoma$.ti,ab. (873)
153 phyllodes.ti,ab. (86)
154 cystosarcoma$.ti,ab. (15)
155 fibroadenoma$.ti,ab. (151)
156 (non adj small adj cell).ti,ab. (3096)
157 (non adj2 small adj2 cell).ti,ab. (3102)
158 (nonsmall adj2 cell).ti,ab. (162)
159 plasmacytoma$.ti,ab. (182)
160 myeloma.ti,ab. (1734)
161 multiple myeloma.ti,ab. (1390)
162 lymphoblastoma$.ti,ab. (12)
163 lymphocytoma$.ti,ab. (12)
164 lymphosarcoma$.ti,ab. (89)
165 immunocytoma.ti,ab. (2)
166 sarcoma$.ti,ab. (4038)

| | |
|---|---|
| 167 | hodgkin$.ti,ab. (1975) |
| 168 | (nonhodgkin$ or non hodgkin$).ti,ab. (1268) |
| 169 | or/136-168 (130134) |
| 170 | 110 and 120 and 135 and 169 (107) |
| 171 | limit 170 to yr="2008 - 2014" (93) |

# 3. EMBASE (via embase.com)

| | | |
|---|---|---|
| #1 | 'patient dropouts'/exp OR 'patient compliance'/exp | 95566 |
| #2 | complian*:ab,ti OR comply*:ab,ti OR complied:ab,ti OR adher*:ab,ti OR noncomplian*:ab,ti OR nonadher*:ab,ti OR uptake:ab,ti OR (patient:ab,ti AND dropout*:ab,ti) OR (treatment*:ab,ti AND refusal*:ab,ti) OR (patient:ab,ti AND (participation:ab,ti OR acceptance:ab,ti)) OR maintenance:ab,ti | 811056 |
| #3 | #1 OR #2 | 854802 |
| #4 | 'attitude'/de OR 'attitude to health'/exp OR 'behavior'/de OR 'assertiveness'/exp OR 'drive'/de OR 'motivation'/exp OR 'habit'/exp OR 'personality'/exp OR 'social determinants of health'/exp OR 'risk factor'/exp OR 'socioeconomics'/exp OR 'social class'/exp OR 'social support'/exp OR 'predictor variable'/exp | 1438822 |
| #5 | attitude:ab,ti OR personality:ab,ti OR behavior:ab,ti OR behaviour:ab,ti OR determinant*:ab,ti OR predictor:ab,ti | 990540 |
| #6 | #4 OR #5 | 2219091 |
| #7 | 'exercise'/de OR 'resistance training'/exp OR 'endurance training'/exp OR 'sport'/exp OR 'physical activity'/exp OR 'kinesiotherapy'/de OR 'movement (physiology)'/de OR 'training'/exp | 511283 |
| #8 | physical*:ab,ti AND (active:ab,ti OR activity:ab,ti OR activities:ab,ti) OR (muscle:ab,ti OR muscles:ab,ti AND strengthen*:ab,ti) OR swim*:ab,ti OR jog*:ab,ti OR run:ab,ti OR running:ab,ti OR walk:ab,ti OR walking:ab,ti OR exercise*:ab,ti OR sport:ab,ti OR sports:ab,ti OR aerobic:ab,ti | 620565 |
| #9 | 'diet'/exp OR 'diet therapy'/exp OR 'feeding behavior'/exp | 495693 |
| #10 | diet:ab,ti OR diets:ab,ti OR dieta*:ab,ti OR diete*:ab,ti OR dieti*:ab,ti OR nutrition*:ab,ti OR (food:ab,ti AND habit*:ab,ti) OR (feeding:ab,ti AND (behavior*:ab,ti OR behaviour*:ab,ti)) OR (eating:ab,ti AND (behavior*:ab,ti OR behaviour*:ab,ti)) | 603837 |
| #11 | 'smoking cessation'/exp OR 'smoking cessation program'/exp OR 'smoking'/de OR 'smoking habit'/exp OR 'tobacco use'/de OR 'tobacco consumption'/exp | 235761 |
| #12 | smoking:ab,ti AND cessation:ab,ti | 21735 |
| #13 | 'alcohol'/exp OR 'alcoholism'/exp OR 'alcohol abuse'/exp | 265310 |
| #14 | alcohol*:ab,ti OR binge:ab,ti OR drink*:ab,ti | 383251 |
| #15 | 'body weight'/de OR 'weight change'/exp OR 'weight control'/exp OR 'weight fluctuation'/exp OR 'weight gain'/exp OR 'weight reduction'/de OR 'body mass'/exp | 453958 |
| #16 | body:ab,ti AND (weight:ab,ti OR mass:ab,ti) OR bmi:ab,ti | 423624 |
| #17 | #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 | 2595551 |
| #18 | 'neoplasm'/exp | 3367194 |
| #19 | cancer*:ab,ti OR tumor*:ab,ti OR tumour*:ab,ti OR carcinoma*:ab,ti OR neoplasm*:ab,ti OR lymphoma:ab,ti OR melanoma:ab,ti OR metastas*:ab,ti OR metastatic:ab,ti OR (non:ab,ti AND small:ab,ti AND cell:ab,ti) OR adenocarcinoma*:ab,ti OR (squamous:ab,ti AND cell:ab,ti) OR nsclc:ab,ti OR osteosarcoma*:ab,ti OR phyllodes:ab,ti OR cystosarcoma*:ab,ti OR fibroadenoma*:ab,ti OR plasmacytoma*:ab,ti OR myeloma*:ab,ti OR lymphoblastoma*:ab,ti OR lymphocytoma*:ab,ti OR sarcoma*:ab,ti OR hodgkin*:ab,ti OR nonhodgkin*:ab,ti | 2771648 |
| #20 | #18 OR #19 | 3798845 |
| #21 | #3 AND #6 AND #17 AND #20 | 2402 |

| | | |
|---|---|---|
| #22 | #21 AND ([article]/lim OR [article in press]/lim OR [review]/lim) AND ([dutch]/lim OR [english]/lim) AND [2008-2014]/py | 827 |

# 4. cochrane library (via wiley)

#1 MeSH descriptor: [Patient Acceptance of Health Care] 1 tree(s) exploded
#2 MeSH descriptor: [Patient Dropouts] 1 tree(s) exploded
#3 (complian* or comply* or complied or adher* or noncomplian* or nonadher* or uptake or (patient and dropout*) or (treatment and refusal*) or (patient and (participation or acceptance)) or maintenance):ti,ab
#4 #1 or #2 or #3
#5 MeSH descriptor: [Attitude to Health] 1 tree(s) exploded
#6 MeSH descriptor: [Attitude] this term only
#7 MeSH descriptor: [Motivation] this term only
#8 MeSH descriptor: [Aspirations (Psychology)] this term only
#9 MeSH descriptor: [Drive] this term only
#10 MeSH descriptor: [Exploratory Behavior] this term only
#11 MeSH descriptor: [Goals] this term only
#12 MeSH descriptor: [Intention] this term only
#13 MeSH descriptor: [Personality] 1 tree(s) exploded
#14 MeSH descriptor: [Social Determinants of Health] this term only
#15 MeSH descriptor: [Risk Factors] this term only
#16 MeSH descriptor: [Socioeconomic Factors] explode all trees
#17 MeSH descriptor: [Social Support] this term only
#18 (attitude or personality or behavior or behaviour or determinant or predictor):ab,ti
#19 #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18
#20 MeSH descriptor: [Exercise] this term only
#21 MeSH descriptor: [Physical Conditioning, Human] this term only
#22 MeSH descriptor: [Resistance Training] this term only
#23 MeSH descriptor: [Sports] 1 tree(s) exploded
#24 MeSH descriptor: [Physical Endurance] 1 tree(s) exploded
#25 MeSH descriptor: [Physical Fitness] this term only
#26 MeSH descriptor: [Exercise Movement Techniques] this term only
#27 MeSH descriptor: [Exercise Therapy] this term only
#28 MeSH descriptor: [Movement] this term only
#29 MeSH descriptor: [Physical Education and Training] 1 tree(s) exploded
#30 ((physical* and (active or activity or activities)) or ((muscle or muscles) and strengthen*) or swim* or jog* or run or running or walk or walking or exercise* or sport or sports or aerobic):ab,ti
#31 MeSH descriptor: [Diet] this term only
#32 MeSH descriptor: [Diet Therapy] this term only
#33 MeSH descriptor: [Nutrition Policy] this term only
#34 MeSH descriptor: [Nutrition Therapy] this term only
#35 MeSH descriptor: [Food Habits] this term only
#36 (diet or diets or dieta* or diete* or dieti* or nutrition* or food habit* or (feeding and (behavior* or behaviour*)) or (eating and (behavior* or behaviour*))):ti,ab
#37 MeSH descriptor: [Tobacco Use Cessation] 1 tree(s) exploded
#38 MeSH descriptor: [Tobacco Use] this term only
#39 (smoking and cessation):ti,ab
#40 MeSH descriptor: [Drinking Behavior] 1 tree(s) exploded
#41 MeSH descriptor: [Alcohol-Related Disorders] this term only
#42 MeSH descriptor: [Binge Drinking] this term only
#43 MeSH descriptor: [Alcoholic Intoxication] this term only
#44 (alcohol* or binge or drink*):ti,ab
#45 MeSH descriptor: [Body Weight] 1 tree(s) exploded
#46 MeSH descriptor: [Body Mass Index] 1 tree(s) exploded
#47 ((body and (weight or mass)) or bmi):ti,ab
#48 #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36 or #37 or #38 or #39 or #40 or #41 or #42 or #43 or #44 or #45 or #46 or #47
#49 MeSH descriptor: [Neoplasms] 1 tree(s) exploded

#50 MeSH descriptor: [Neoplasm Staging] this term only
#51 MeSH descriptor: [Neoplasm Metastasis] 1 tree(s) exploded
#52 MeSH descriptor: [Neoplastic Processes] 1 tree(s) exploded
#53 (cancer* or tumor* or tumour* or carcinoma* or neoplasm* or lymphoma or melanoma or metastas* or metastatic or (non and small and cell) or adenocarcinoma* or (squamous and cell) or nsclc or osteosarcoma* or phyllodes or cystosarcoma* or fibroadenoma* or plasmacytoma* or myeloma* or lymphoblastoma* or lymphocytoma* or sarcoma* or hodgkin* or nonhodgkin*):ti,ab
#54 #49 or #50 or #51 or #52 or #53
#55 #4 and #19 and #48 and #54

# 5. CINAHL

| | | |
|---|---|---|
| S38 | S7 AND S19 AND S34 AND S37 | 80 |
| S37 | S35 OR S36 | 220159 |
| S36 | cancer* or tumor* or tumour* or carcinoma* or neoplasm* or lymphoma or melanoma or metastas* or metastatic or (non and small and cell) or adenocarcinoma* or (squamous and cell) or nsclc or osteosarcoma* or phyllodes or cystosarcoma* or fibroadenoma* or plasmacytoma* or myeloma* or lymphoblastoma* or lymphocytoma* or sarcoma* or hodgkin* or nonhodgkin* | 207527 |
| S35 | (MH "Neoplasms+") | 173590 |
| S34 | S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 | 177561 |
| S33 | (MH "Body Mass Index") | 30377 |
| S32 | (MH "Body Weight") | 9712 |
| S31 | (MH "Binge Drinking") | 17 |
| S30 | (MH "Drinking Behavior") | 629 |
| S29 | (MH "Alcoholism") OR (MH "Alcohol Drinking") OR (MH "Alcohol-Related Disorders") | 18701 |
| S28 | (MH "Smoking Cessation") OR (MH "Smoking Cessation Programs") OR (MH "Smoking") | 33030 |
| S27 | (MH "Food Habits") | 4783 |
| S26 | (MH "Nutrition Policy") OR (MH "Nutrition") | 14054 |
| S25 | (MH "Diet Therapy") | 1174 |
| S24 | (MH "Diet") | 22716 |
| S23 | (MH "Therapeutic Exercise") | 11177 |
| S22 | (MH "Physical Fitness") | 7708 |
| S21 | (MH "Sports+") | 35735 |
| S20 | (MH "Exercise") OR (MH "Resistance Training") | 21845 |
| S19 | S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 | 392541 |
| S18 | (MH "Support Psychosocial+") | 36935 |
| S17 | predictor* | 40406 |
| S16 | (MH "Independent Variable") | 2502 |
| S15 | (MH "Socioeconomic Factors+") | 166981 |
| S14 | (MH "Risk Factors") | 59859 |
| S13 | determinant* | 14044 |
| S12 | (MH "Social Determinants of Health") | 33 |
| S11 | (MH "Goals and Objectives") OR (MH "Goal-Setting") OR (MH "Goal Attainment") | 8629 |
| S10 | "aspirations" | 857 |
| S9 | (MH "Motivation") OR (MH "Drive") OR (MH "Personality+") OR (MH "Intention") | 96183 |
| S8 | (MH "Attitude") OR (MH "Attitude to Health") OR (MH "Health Beliefs") | 30105 |
| S7 | S1 OR S2 OR S3 OR S4 OR S5 OR S6 | 94545 |
| S6 | complian* or comply* or complied or adher* or noncomplian* or nonadher* or maintenance | 73350 |

| | | |
|---|---|---|
| S5 | "uptake" | 11118 |
| S4 | "adherence" | 16336 |
| S3 | (MH "Patient Compliance+") OR (MH "Treatment Refusal") | 24820 |
| S2 | (MH "Patient Dropouts") | 620 |
| S1 | "acceptance" | 8504 |

# 6. PEDRO

Subdiscipline oncology: Abstract & Title

- complian*: N=15
- comply: N=5
- complied: N=0
- adher*: N=86
- noncomplian*: N=1
- nonadher*: N=0
- uptake: N=14
- dropout: N=8
- refusal: N=2
- acceptance: N=6
- maintenance: N=32

# Search strings Question 2

## 1. medline (ovid)

1 exp Neoplasms/ (2498041)
2 Neoplasm Staging/ (117705)
3 cancer$.ti,ab. (976234)
4 tumor$.ti,ab. (893907)
5 tumour$.ti,ab. (190963)
6 carcinoma$.ti,ab. (439770)
7 neoplasm$.ti,ab. (91812)
8 lymphoma.ti,ab. (104945)
9 melanoma.ti,ab. (70977)
10 staging.ti,ab. (47081)
11 metastas$.ti,ab. (203996)
12 metastatic.ti,ab. (130750)
13 exp Neoplasm Metastasis/ (152011)
14 exp neoplastic processes/ (324415)
15 neoplastic process$.ti,ab. (2230)
16 non small cell.ti,ab. (28431)
17 adenocarcinoma$.ti,ab. (89494)
18 squamous cell.ti,ab. (61682)
19 nsclc.ti,ab. (16298)
20 osteosarcoma$.ti,ab. (14053)
21 phyllodes.ti,ab. (1234)
22 cystosarcoma$.ti,ab. (550)
23 fibroadenoma$.ti,ab. (2852)
24 (non adj small adj cell).ti,ab. (28431)
25 (non adj2 small adj2 cell).ti,ab. (28634)
26 (nonsmall adj2 cell).ti,ab. (1673)
27 plasmacytoma$.ti,ab. (5097)
28 myeloma.ti,ab. (34422)
29 multiple myeloma.ti,ab. (22186)
30 lymphoblastoma$.ti,ab. (258)
31 lymphocytoma$.ti,ab. (261)
32 lymphosarcoma$.ti,ab. (3588)
33 immunocytoma.ti,ab. (401)
34 sarcoma$.ti,ab. (68644)
35 hodgkin$.ti,ab. (49942)
36 (nonhodgkin$ or non hodgkin$).ti,ab. (28671)
37 or/1-36 (2876408)
38 return-to-work.tw. (5270)
39 employment.tw. (33619)
40 unemployment.tw. (6136)
41 unemployed.tw. (4795)
42 retirement.tw. (7735)
43 sick leave.tw. (2995)
44 sickness absence.tw. (1349)
45 absenteeism.tw. (3414)
46 disability management.tw. (194)
47 exp Employment/ (53009)
48 exp Unemployment/ (5058)
49 exp Sick Leave/ (3747)
50 exp Absenteeism/ (7153)
51 exp Work/ (13295)
52 exp Occupations/ (26182)
53 exp Occupational Medicine/ (21660)
54 exp Occupational Health/ (24383)
55 exp Occupational Health Services/ (9554)

56 exp Rehabilitation, Vocational/ (8955)
57 occupation*.tw. (103213)
58 vocational*.tw. (7487)
59 work ability.tw. (680)
60 work capacity.tw. (3783)
61 work activity.tw. (520)
62 work disability.tw. (1257)
63 work rehabilitation.tw. (180)
64 work status.tw. (1175)
65 work retention.tw. (36)
66 workability.tw. (180)
67 employability.tw. (361)
68 employable.tw. (166)
69 employee*.tw. (29493)
70 or/38-69 (282110)
71 37 and 70 (19125)
72 randomized controlled trial.pt. (362054)
73 controlled clinical trial.pt. (87462)
74 randomized.ab. (262574)
75 placebo.ab. (142174)
76 clinical trials as topic.sh. (167631)
77 randomly.ab. (187448)
78 trial.ti. (112531)
79 72 or 73 or 74 or 75 or 76 or 77 or 78 (833512)
80 exp animals/ not humans.sh. (3878559)
81 79 not 80 (765630)
82 meta-analysis.mp,pt. or review.pt. or search:.tw. (1985170)
83 81 or 82 (2634437)
84 71 and 83 (3829)
85 limit 84 to yr="2008 - 2014" (937)

## 2. PreMedline (OVID)

3 cancer$.ti,ab. (73823)
4 tumor$.ti,ab. (53379)
5 tumour$.ti,ab. (11030)
6 carcinoma$.ti,ab. (24756)
7 neoplasm$.ti,ab. (5448)
8 lymphoma.ti,ab. (5414)
9 melanoma.ti,ab. (3665)
10 staging.ti,ab. (3159)
11 metastas$.ti,ab. (14702)
12 metastatic.ti,ab. (9582)
15 neoplastic process$.ti,ab. (110)
16 non small cell.ti,ab. (3082)
17 adenocarcinoma$.ti,ab. (5663)
18 squamous cell.ti,ab. (4332)
19 nsclc.ti,ab. (2180)
20 osteosarcoma$.ti,ab. (874)
21 phyllodes.ti,ab. (88)
22 cystosarcoma$.ti,ab. (15)
23 fibroadenoma$.ti,ab. (151)
24 (non adj small adj cell).ti,ab. (3082)
25 (non adj2 small adj2 cell).ti,ab. (3087)
26 (nonsmall adj2 cell).ti,ab. (162)
27 plasmacytoma$.ti,ab. (181)
28 myeloma.ti,ab. (1734)
29 multiple myeloma.ti,ab. (1388)
30 lymphoblastoma$.ti,ab. (12)
31 lymphocytoma$.ti,ab. (12)

32 lymphosarcoma$.ti,ab. (89)
33 immunocytoma.ti,ab. (2)
34 sarcoma$.ti,ab. (4044)
35 hodgkin$.ti,ab. (1968)
36 (nonhodgkin$ or non hodgkin$).ti,ab. (1264)
37 or/3-36 (130223)
38 return-to-work.tw. (422)
39 employment.tw. (2491)
40 unemployment.tw. (420)
41 unemployed.tw. (362)
42 retirement.tw. (498)
43 sick leave.tw. (207)
44 sickness absence.tw. (97)
45 absenteeism.tw. (233)
46 disability management.tw. (17)
57 occupation*.tw. (7192)
58 vocational*.tw. (486)
59 work ability.tw. (88)
60 work capacity.tw. (85)
61 work activity.tw. (36)
62 work disability.tw. (75)
63 work rehabilitation.tw. (18)
64 work status.tw. (110)
65 work retention.tw. (5)
66 workability.tw. (31)
67 employability.tw. (32)
68 employable.tw. (10)
69 employee*.tw. (1570)
70 or/38-69 (12739)
71 37 and 70 (718)
72 randomized controlled trial.pt. (608)
73 controlled clinical trial.pt. (68)
74 randomized.ab. (20396)
75 placebo.ab. (7553)
76 clinical trials as topic.sh. (1)
77 randomly.ab. (18269)
78 trial.ti. (8324)
79 72 or 73 or 74 or 75 or 76 or 77 or 78 (43809)
80 exp animals/ not humans.sh. (5)
81 79 not 80 (43809)
82 meta-analysis.mp,pt. or review.pt. or search:.tw. (30886)
83 81 or 82 (71201)
84 71 and 83 (64)
85 limit 84 to yr="2008 - 2014" (54)

# 3. EMBASE (via embase.com)

| | | |
|---|---|---|
| #1 | cancer*:ab,ti OR tumor*:ab,ti OR tumour*:ab,ti OR carcinoma*:ab,ti OR neoplasm*:ab,ti OR lymphoma:ab,ti OR melanoma:ab,ti OR metastas*:ab,ti OR metastatic:ab,ti OR (non:ab,ti AND small:ab,ti AND cell:ab,ti) OR adenocarcinoma*:ab,ti OR (squamous:ab,ti AND cell:ab,ti) OR nsclc:ab,ti OR osteosarcoma*:ab,ti OR phyllodes:ab,ti OR cystosarcoma*:ab,ti OR fibroadenoma*:ab,ti OR plasmacytoma*:ab,ti OR myeloma*:ab,ti OR lymphoblastoma*:ab,ti OR lymphocytoma*:ab,ti OR sarcoma*:ab,ti OR hodgkin*:ab,ti OR nonhodgkin*:ab,ti | 2775265 |
| #2 | 'neoplasm'/exp | 3371059 |
| #3 | #1 OR #2 | 3803365 |

| | | |
|---|---|---|
| #4 | 'return to work':ab,ti OR employment:ab,ti OR unemployment:ab,ti OR retirement:ab,ti OR 'sick leave':ab,ti OR 'sickness absence':ab,ti OR absenteeism:ab,ti OR 'disability management':ab,ti OR occupation*:ab,ti OR vocational*:ab,ti OR 'work ability':ab,ti OR 'work capacity':ab,ti OR 'work activity':ab,ti OR 'work disability':ab,ti OR 'work rehabilitation':ab,ti OR 'work status':ab,ti OR 'work retention':ab,ti OR workability:ab,ti OR employability:ab,ti OR employable:ab,ti OR employee*:ab,ti | 245024 |
| #5 | 'occupation'/exp OR 'unemployment'/exp OR 'work'/exp OR 'occupational medicine'/exp OR 'occupational health'/exp OR 'vocational rehabilitation'/exp | 552354 |
| #6 | #4 OR #5 | 662763 |
| #7 | #3 AND #6 | 42812 |
| #8 | #7 AND ([cochrane review]/lim OR [meta analysis]/lim OR [randomized controlled trial]/lim OR [systematic review]/lim) AND ([article]/lim OR [article in press]/lim OR [review]/lim) AND ([dutch]/lim OR [english]/lim) AND [2008-2014]/py | 352 |

## 4. cochrane library (via wiley)

#1 (return-to-work or employment or unemployment or retirement or 'sick leave' or 'sickness absence' or absenteeism or 'disability management' or occupation* or vocational* or 'work ability' or 'work capacity' or 'work activity' or 'work disability' or 'work rehabilitation' or 'work status' or 'work retention' or workability or employability or employable or employee*):ab,ti
#2 MeSH descriptor: [Employment] 1 tree(s) exploded
#3 MeSH descriptor: [Sick Leave] 1 tree(s) exploded
#4 MeSH descriptor: [Absenteeism] explode all trees
#5 MeSH descriptor: [Work] 1 tree(s) exploded
#6 MeSH descriptor: [Occupations] 1 tree(s) exploded
#7 MeSH descriptor: [Occupational Medicine] 1 tree(s) exploded
#8 MeSH descriptor: [Occupational Health] 1 tree(s) exploded
#9 MeSH descriptor: [Occupational Health Services] 1 tree(s) exploded
#10 MeSH descriptor: [Rehabilitation, Vocational] 1 tree(s) exploded
#11 #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10
#12 MeSH descriptor: [Neoplasms] 1 tree(s) exploded
#13 MeSH descriptor: [Neoplasm Staging] this term only
#14 MeSH descriptor: [Neoplasm Metastasis] 1 tree(s) exploded
#15 MeSH descriptor: [Neoplastic Processes] 1 tree(s) exploded
#16 (cancer* or tumor* or tumour* or carcinoma* or neoplasm* or lymphoma or melanoma or metastas* or metastatic or (non and small and cell) or adenocarcinoma* or (squamous and cell) or nsclc or osteosarcoma* or phyllodes or cystosarcoma* or fibroadenoma* or plasmacytoma* or myeloma* or lymphoblastoma* or lymphocytoma* or sarcoma* or hodgkin* or nonhodgkin*):ti,ab
#17 #12 or #13 or #14 or #15 or #16
#18 #11 and #17

## 5. CINAHL

| | | |
|---|---|---|
| S18 | S16 OR S17 | 38 |
| S17 | S15 | 1 |
| S16 | S15 | 37 |
| S15 | S3 AND S14 | 5839 |
| S14 | S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 | 234633 |
| S13 | (MH "Rehabilitation, Vocational") | 4197 |
| S12 | (MH "Occupational Health") OR (MH "Occupational Health Services") | 15192 |
| S11 | (MH "Occupational Medicine") | 75 |
| S10 | (MH "Occupations and Professions+") | 49849 |

| | | |
|---|---|---|
| S9 | (MH "Work") | 2721 |
| S8 | (MH "Absenteeism") | 2427 |
| S7 | (MH "Sick Leave") | 2454 |
| S6 | (MH "Unemployment") | 1883 |
| S5 | (MH "Employment+") | 27794 |
| S4 | TX return-to-work or employment or unemployment or retirement or 'sick leave' or 'sickness absence' or absenteeism or 'disability management' or occupation* or vocational* or 'work ability' or 'work capacity' or 'work activity' or 'work disability' or 'work rehabilitation' or 'work status' or 'work retention' or workability or employability or employable or employee* | 190323 |
| S3 | S1 OR S2 | Display |
| S2 | cancer* or tumor* or tumour* or carcinoma* or neoplasm* or lymphoma or melanoma or metastas* or metastatic or (non and small and cell) or adenocarcinoma* or (squamous and cell) or nsclc or osteosarcoma* or phyllodes or cystosarcoma* or fibroadenoma* or plasmacytoma* or myeloma* or lymphoblastoma* or lymphocytoma* or sarcoma* or hodgkin* or nonhodgkin* | Display |
| S1 | (MH "Neoplasms+") | Display |

# 6. PSYCINFO

1 exp Neoplasms/ (33378)
2 cancer$.ti,ab. (37451)
3 tumor$.ti,ab. (9112)
4 tumour$.ti,ab. (1283)
5 carcinoma$.ti,ab. (1192)
6 neoplasm$.ti,ab. (773)
7 lymphoma.ti,ab. (731)
8 melanoma.ti,ab. (526)
9 staging.ti,ab. (1395)
10 metastas$.ti,ab. (905)
11 metastatic.ti,ab. (1024)
12 neoplastic process$.ti,ab. (18)
13 non small cell.ti,ab. (149)
14 adenocarcinoma$.ti,ab. (205)
15 squamous cell.ti,ab. (145)
16 nsclc.ti,ab. (61)
17 osteosarcoma$.ti,ab. (57)
18 phyllodes.ti,ab. (0)
19 cystosarcoma$.ti,ab. (0)
20 fibroadenoma$.ti,ab. (2)
21 (non adj small adj cell).ti,ab. (149)
22 (non adj2 small adj2 cell).ti,ab. (151)
23 (nonsmall adj2 cell).ti,ab. (24)
24 plasmacytoma$.ti,ab. (8)
25 myeloma.ti,ab. (159)
26 lymphoblastoma$.ti,ab. (1)
27 lymphocytoma$.ti,ab. (0)
28 lymphosarcoma$.ti,ab. (7)
29 immunocytoma.ti,ab. (0)
30 sarcoma$.ti,ab. (301)
31 hodgkin$.ti,ab. (559)
32 (nonhodgkin$ or non hodgkin$).ti,ab. (184)
33 or/1-32 (51298)
34 return-to-work.tw. (1606)
35 employment.tw. (37030)
36 unemployment.tw. (6677)
37 unemployed.tw. (4879)
38 retirement.tw. (6934)
39 sick leave.tw. (869)
40 sickness absence.tw. (606)

41 absenteeism.tw. (3058)
42 disability management.tw. (198)
43 exp Employment Status/ (14085)
44 exp Unemployment/ (3103)
45 exp Employee Leave Benefits/ (651)
46 exp Employee Absenteeism/ or exp Employee Attitudes/ (27338)
47 exp "Work (Attitudes Toward)"/ (5430)
48 exp Occupations/ (7341)
49 exp Occupational Health/ (796)
50 exp Vocational Rehabilitation/ (5904)
51 occupation*.tw. (50380)
52 vocational*.tw. (30461)
53 work ability.tw. (585)
54 work capacity.tw. (430)
55 work activity.tw. (501)
56 work disability.tw. (360)
57 work rehabilitation.tw. (182)
58 work status.tw. (800)
59 work retention.tw. (15)
60 workability.tw. (71)
61 employability.tw. (1108)
62 employable.tw. (168)
63 employee*.tw. (46201)
64 or/34-63 (181694)
65 33 and 64 (1278)
66 limit 65 to yr="2008 - 2014" (632)
67 randomized.ab. (36974)
68 placebo.ab. (29643)
69 randomly.ab. (49634)
70 trial.ti. (16816)
71 exp clinical trials/ (7311)
72 meta-analysis.mp,pt. or review.pt. or search:.tw. (72511)
73 67 or 68 or 69 or 70 or 71 or 72 (179795)
74 66 and 73 (54)

*31. Evidence tables cost-effectiveness*

# QUESTION 1: Are rehabilitation interventions in cancer patients cost-effective?

Multimodal interventions

| Study ID, country | Method & Funding | Patient characteristics | Interventions & variables | Results and sensitiv analysis (S.A.) |
|---|---|---|---|---|
| Farquhar et al.[1], England | Clinical data<br>· Design: RCT with two arms; randomization by blocks of random size two, four and six, generated by statistician and concealed within sealed opaque envelop until allocation notification by intervention deliverer;<br>· Setting: Community setting<br>· Sample size: 54 (67 allocated)<br>· Recruitment: November 2008-January 2012<br>· Data collection: Baseline (t1: week 1 = before randomization), week 3, week 5. Outcomes measured were: patient distress due to breathlessness using a numerical rating scale, disease-specific health related quality-of-life (Chronic Respiratory Questionnaire: CRQ), and anxiety and depression (Hospital Anxiety and Depression Scale: HADS), EQ-5D and measures of service use (8-weeks and 2-weeks prior to baseline and at week3).<br><br>Economic evaluation<br>· Type: CEA; using primary clinical data<br>· Perspective: Not stated; (results for healthcare & social care)<br>· Cost year & monetary unit: 2011-2012; GBP<br>· Length of evaluation: less than 12-weeks<br><br>Funding: Cambridge University Hospitals' NHS Foundation Trust | · Cancer type: Advanced cancer patients<br>· Eligibility criteria: if patients met BIS (Breathlessness Intervention Service) referral criteria (that is, diagnosed appropriately-treated cause of breathlessness, troubled by breathlessness in spite of optimisation of underlying illness, and might benefit from a self-management programme); and not having received BIS previously. | Intervention s: The BIS team comprises: a palliative care medical consultant, a clinical specialist occupational therapist, a clinical specialist physiotherapist and an administrator. At a weekly multidisciplinary team meeting cases are allocated to the most appropriate professional based on information derived from the referral; many patients receive visits from at least two professionals on the team. The intervention is delivered predominantly in the home setting with visits lasting 1-1.5 hours. Visits include interventions relevant to that person and formulation of an individually-tailored exercise plan.<br>· IG: intervention group, n=28 (allocated n=35);<br>· CWL, control waiting list, n=26 (allocated n=32). Control had to wait and received intervention after week 3.<br><br>Program duration : 2-weeks<br><br>Variables included in CEA:<br>· Patient distress, anxiety, depression and EQ-5D.<br>· Healthcare costs, including intervention costs.<br>· Informal care costs | Effects:<br>· Patient distress du breathlessness: IG ac sign. greater, reductio compared to CWL: ad difference –1.29 (95% to –0.005), p = 0.049.<br>· Incremental QALY 0.0002 (95%CI: -0.00 for IG vs CWL<br>· No sign. difference between arms for othe outcomes.<br><br>Costs:<br>· IG had health/soci savings were on avera compared to CWL (95 -£918 to £310).<br><br>Economic evaluation<br>· Lower health/socia costs and better prima outcome results for IG dominance over CG<br><br>Sensitivity analysis:<br>· One-way S.A. wer performed. Bootstrapp applied<br>· S.A. results confir baseline results |
| Gordon et al.[2],[1] Australia | Clinical data<br>· Design: Decision tree model using effectiveness and clinical | · Cancer type: Breast cancer patients | Interventions: DAART (Domiciliary Allied Health and Acute Care | Effects:<br>· Proportion of reha cases: similar for STR |

| | | | | |
|---|---|---|---|---|
| | data from prospective followed cohorts.<br>· prospective followed cohorts<br>· Setting: 1 university<br>· Sample size: 276<br>· Recruitment: May 2002-July 2003<br>· Data collection: Medical records and self-administered questionnaires (pre-intervention, post-intervention, 6 and 12 months from date of diagnosis), including rehabilitated cases, QALYs and costs<br><br>Economic evaluation:<br>· Type: CEA, using primary clinical data and modelling (decision tree)<br>· Perspective: Societal<br>· Cost year & monetary unit: 2004, AU$<br>· Length of evaluation: 1-year<br><br>Funding: PhD scholarship from the National Breast Cancer Foundation and Women in Super | · Eligibility criteria: Women diagnosed with primary breast cancer, had unilateral disease, spoke English, had no cognitive problems and were aged 25-74 years | Rehabilitation Team: Home-based physiotherapy and education vs STRETCH (Strength Through Recreation Exercise Togetherness Care Health): group-based exercise, education and psychosocial intervention<br>· DAART, n=36<br>· STRETCH, n=31<br>· SC: standard care, n=208<br><br>Program duration::<br>· DAART: 6 weeks (maximum);<br>· STRETCH: 8 weeks<br><br>Variables included in CEA<br>· Effect variables: Rehabilitated cases, QALYs<br>· Intervention costs, direct healthcare costs, costs borne by patients and productivity losses (leisure time, volunteers, …) | DAART but slightly hig (not sign. different)<br>· Mean adjusted uti for DAART: 0.84 (95% 0.77-0.90), STRETCH (95%CI: 0.73-0.87) ar 0.72 (95%CI: 0.70-0.7 different.<br><br>Costs:<br>· Total costs/particip $1,038 for STRETCH DAART and $189 for<br><br>Economic evaluation<br>· Rehabilitated case dominant above DAA STRETCH (i.e. more and less costly than th interventions);<br>· QALY: ICER for D STRETCH is AU$1,34 AU$14,478, compared<br><br>Sensitivity analysis:<br>· One-way S.A.; mo did not influence resul |
| Jones et al.[3], England | Clinical data<br>· Design: Two-arm RCT.<br>· Setting: 1 hospice<br>· Sample size: 36<br>· Recruitment: August 2010-July 2011<br>· Data collection: at baseline and after 3-months. These were: Supportive Care Needs Survey Long Form (SCNS-LF59); Kessler Psychological distress Scale (K10); continuity of Care; EQ5D. Service use was collected retrospectively for 3-months from randomization. Societal and demographic data, diagnosis, and disease severity were collected at baseline.<br><br>Economic evaluation<br>· Type: CUA, using primary clinical data<br>· Perspective: Not stated; NHS perspective (at least this threshold is used)<br>· Cost year & monetary unit: Not stated (trial | · Cancer type: Malignant breast cancer or haematological disease<br>· Eligibility criteria: at the end of treatment for first or subsequent recurrence but not cured; with active, progressive, recurrent malignant breast or haematological disease; older than 18 years and meet pre-set referral criteria (i.e. completed treatment, but advanced, progressive disease and recurrence was likely; required symptom management; had rehabilitation needs not responsive to self-management; | Interventions included four core components, including systematic clinical assessment; goal setting with review and referrals on a case by case basis, according to needs and weekly meetings [2].<br>· IG: intervention group: n=20 (allocated n=21).<br>· CWL, control waiting list: n=16 (allocated: n=20) ; received usual care (i.e. including ongoing review by oncologists and access to community services including general practitioner (GP), district nurses, social services, and community specialist palliative care), and joined a three-month wait-list for referral to the intervention.<br><br>Program duration:<br>~3-months with flexibility of duration<br><br>Variables included in CEA | Effects:<br>· IG had greater QA than CWL (mean diffe QALY, 95% CI 0.000-<br>· Primary outcome secondary outcomes significant different at (e.g. IG had sign. lowe for support on the psy subscale of the SCNS CWL (adjusted differe points)). Other signific outcomes included the and patient care subs the SCNS and the sel health state.<br>· Other secondary r all favoured better out the IG, but without sig differences.<br><br>Costs:<br>· IG had higher cos CWL<br><br>Economic evaluation<br>· ICER of £ 19,391 gained. At a WTP of £ £30,000, the intervent |

| | | | | |
|---|---|---|---|---|
| | year:2010-2011); GBP<br>· Length of evaluation: 3-month<br><br>Funding: Marie Curie Cancer Care | had psychological, social, financial, emotional, and spiritual needs not met by the present care); and able to reach the hospice by their own or hospice-based transport. | · SCNS psychological domain (primary outcome) and as secondary outcomes: other domains; K10, continuity of care, EQ5D (utility and EQ5D VAS)<br>· QALY<br>· Healthcare utilization (including intervention) & cost | expected to be cost-e<br>55.4% or 73.3% of sin<br>respectively<br><br>Sensitivity analysis:<br>· No on-way sensiti<br>analysis<br>· PSA using Monte<br>sampling techniques |
| Mourgues et al.[4], France | Clinical data<br>· Design: Two-arm, multicenter RCT, stratified by menopausal status.<br>· Setting: 1 university hospital and 2 private hospitals<br>· Sample size: Economic evaluation, n=90; Trial: n=232 [5]<br>· Recruitment: March 2008-October 2010<br>· Data collection: at baseline, 6 and 12 months. Women's activities by calculating separately the total hourly volume of overall activities and occupational and non-occupational activities (i.e. primary outcome). Daily abilities (= secondary outcome).<br><br>Economic evaluation<br>· Type: CEA; using primary clinical data<br>· Perspective: Societal perspective<br>· Cost year & monetary unit: Not stated; €<br>· Length of evaluation: 1-year<br><br>Funding: French association of thermal centers, the city of Clermont-Ferrand, the regional council of Auvergne and the association "Ligue contre le Cancer" | · Cancer type: Complete breast cancer remission<br>· Eligibility criteria: women in complete breast cancer remission without contraindication for physical activities or cognitive disorders and a body mass index between 18.5 and 40 kg/m2 | Interventions: IG underwent spa treatment (i.e. two week multicomponent programme composed of interventions such as physiotherapy, nutritional advice, thermal water treatment, daily 2-h physical activity, running and basic dietary follow-up over a period of 15 days) combined with consultation with dietician every 6 months;<br>· IG, intervention group, n=42 for CEA (trial n=117) [5]<br>· SC, standard care & consultations with the dietician every 6 months, n=48 for CEA (trial n=115) [5]<br><br>Program duration:<br>· 2-week spa treatment & consultation with dietician every 6 months<br><br>Variables included in CEA<br>· Overall activities, occupant and non-occupant activities (and as considered as an effect, productivity losses for absence from paid and unpaid work was not considered)<br>· Intervention costs and direct healthcare costs<br>· Indirect medical costs comprised out-of-pocket expenses associated with the disease and daily allowances. | Effects:<br>· IG had greater res<br>overall activities durin<br>12-month period vs S<br>(p=0.025).<br>· There was an inte<br>effect (p=0.04) with re<br>resumption of occupa<br>activities: more wome<br>tended to return to wo<br>· Positive effect in t<br>the women's ability to<br>occupation activities 1<br>after the beginning of<br>(p=0.0014), and on th<br>to perform family activ<br>(p=0.033).<br><br>Costs:<br>· *Not stated*<br><br>Economic evaluation<br>· Overall activities:<br>thermal treatment was<br>expensive and not cos<br>At T12, the interventio<br>more expensive but a<br>effective.<br>· Occupational activ<br>T6, the thermal treatm<br>too expensive for the<br>increase in effectivene<br>whereas at T12 the in<br>was slightly expensive<br>more effective and the<br>cost-efficient.<br><br>Sensitivity analysis: N |
| Round et al.[6], England [3] | Clinical data, see Jones et al.[3]), and using modelling for extrapolation treatment costs and benefits beyond the initial | · Cancer type: see Jones et al.[3]<br>· Eligibility criteria: see Jones et al.[3] | Interventions: see Jones et al.[3].<br><br>Program duration: see | Effects:<br>· At 3-months (i.e. t<br>the mean differences<br>was 0.052 (95%CI: 0. |

| | | | | |
|---|---|---|---|---|
| | 3-month follow-up period in S.A.<br><br>Economic evaluation<br>· Type: CUA, using primary clinical data & modelling<br>· Perspective: NHS perspective & a personal social services perspective<br>· Cost year & monetary unit: Not stated (~2010-2011); GBP<br>· Length of evaluation: 3-month (trial), and S.A. assuming that the benefit of treatment being maintained over three, six and nine months beyond completion of the follow-up<br><br>Funding: Marie Curie Cancer Care | | Jones et al.[3]<br><br>Variables included in CEA<br>· QALY<br>· Intervention costs and direct healthcare costs | Costs:<br>· At 3-months (i.e. t period), the expected differences in costs in base-case analysis wa (95%CI: £221 to £1,27<br><br>Economic evaluation<br>· ICER of the mean incremental values is per QALY gained<br><br>Sensitivity analysis:<br>· One-way S.A. and<br>· The results of the are sensitive to the m to estimate QALYs;<br>· 'The longer treatm is maintained, the mo becomes that the inte represents a cost-effe of resources' |
| Mewes et al.[7], the Netherlands | Clinical data:<br>· Design: Markov model consisting of four health states: "menopausal symptoms", "reduction in menopausal symptoms", "recurrence" and "death", using effectiveness and clinical data came from a 4-arm RCT of Duijts et al.[8, 9], n=420 randomly allocated using computerized block randomization [9]<br>· Setting/sample size: Hypothetical cohort of 1,000 women of 48 years. Trial (multi-center)<br>· Recruitment: N.A.<br>· Data input: Effectiveness data mainly based on RCT published by Duijts et al.[9], but extrapolated up to 5 years<br><br>Economic evaluation<br>· Type: CEA; using model<br>· Perspective: Dutch healthcare system perspective<br>· Cost year & monetary unit: Not stated; €<br>· Length of evaluation: Base-case: 6-month; S.A.: 1.5, 3 and 5 years, discounting effects with 1.5% and costs with 4% according to Dutch guidelines | · Cancer type: Breast cancer patients experience (severe) menopausal symptoms after an early onset of menopause caused by cancer treatment<br>· *Eligibility criteria*: Hypothetical cohort of 1,000 patients with a starting age of 48 years and starting in the Markov health state "menopausal symptoms" | Interventions: Comparing cognitive behavioural therapy (CBT) vs physical exercise (PE)[4].<br>In the original trial[10], sample size per arm was:<br>· CBT, n=109<br>· PE, n=104<br>· CWL: control waiting list: n=103.<br><br>Program duration:<br>· CBT intervention involved six weekly groups sessions of 90 min each.[9]<br>· PE intervention consisted of a 12-week home-based exercise program, individually tailored during an intake session with a physiotherapist. [9]<br><br>Variables modelled & included in CEA<br>· Deriving QALY, by using SF36 from the trial and converting to EQ5D values<br>· Intervention costs, healthcare utilization & cost, | Effects:<br>· Total QALY gain w across the interventio and higher than CWL<br><br>Costs:<br>· The costs of the interventions were €1 and €197 for PE<br><br>Economic evaluation<br>· ICURs indicate tha likely the most cost-ef treatment, followed by compared to WLC<br><br>Sensitivity analysis:<br>· One-way S.A. and<br>· At a ceiling ratio o €30,000/QALY, the in would no longer be co cost-effective when th of treatment effect is 3 years. |

| | | | | |
|---|---|---|---|---|
| | Funding: Alpe d'Huzes, a foundation that is part of the Dutch Cancer Society | | | |

Exercise interventions

| Study ID, country | Method & Funding | Patient characteristics | Interventions & variables | Results and se analysis (S.A.) |
|---|---|---|---|---|
| Retel et al. [11], the Netherlands | Clinical data<br>· Design: Markov model with three mutually exclusive health states: “complete remission”, “recurrent disease” and “death” using data from two RCT. Data for usual care (SC) were derived from a multi-center RCT comparing intra-arterial and intervenous chemo radiation in advanced head and neck cancer [12] and data for a preventive (swallowing) exercise program (PREPP) were derived from a clinical trial conducted immediately following the former RCT [13]<br>· Setting/sample size: Hypothetical cohort of 1,000 patients of 55 years<br>· Recruitment: N.A.<br>· Data input: Based on the two RCTs (i.e. [12, 13]) and literature<br><br>Economic evaluation<br>· Type: CUA, using modelling<br>· Perspective: Healthcare perspective<br>· Cost year & monetary unit: 2008; €<br>· Length of evaluation: 1-year time horizon<br><br>Funding: Nothing stated | · Cancer type: Head and neck cancer patients.<br>· *Eligibility criteria*: Hypothetical cohort of patients aged 55 years and starting with treatment | Interventions: Preventive (swallowing) exercise program. In the original trial:<br>· PREEP (i.e. intervention group), n=37<br>· SC, standard care, n=43<br><br>Program duration: Not stated<br><br>Variables included in CEA<br>· QALYs partly based on trial, literature and expert elicitation<br>· Intervention costs and direct healthcare costs | Effects:<br>· QALY: 0.77 vs 0.68 (SC)<br><br>Costs:<br>· Total health (Treatment + pre exercise) /patien €42,271 for PRE €41,986 for SC<br><br>Economic evalu<br>· ICER of PRE compared to SC per QALY gaine<br><br>Sensitivity analy<br>· One-way an S.A.<br>· Majority of a resulted in an ICER<€20,000 p |

Psychosocial interventions

| Study ID, country | Method & Funding | Patient characteristics | Interventions & variables | Results and se analysis (S.A.) |
|---|---|---|---|---|
| Arving et al. [14], Sweden | Clinical data<br>· Design: RCT with three groups; randomization in blocks[15],<br>· Setting: 1 university hospital<br>· Sample size: n=168<br>· Recruitment: December | · Cancer type: Breast cancer patients starting adjuvant therapy<br>· Eligibility criteria: Breast cancer patients starting | Interventions took place outside the hospital, face-to-face or over the telephone, and started in median 20 days after inclusion. They were similar and used the same techniques such as relaxation, distraction, activity | Effects:<br>· QALY was h INP-group (1.59 compared with I (1.52) and SC-g (1.43). |

| | | | | |
|---|---|---|---|---|
| | 1997-December 1999<br>· Data collection: Demographic and medical data were retrieved from patient files. Health utilities were measured at baseline and at 1, 3,6, 9, 12 and 24 months<br><br>Economic evaluation:<br>· Type: CUA using primary clinical data;<br>· Perspective: British National Health Service perspective:<br>· Cost year & monetary unit: 2004; €<br>· Length of evaluation: 2-years (no discounting applied)<br><br>Funding: Swedish Cancer Society | adjuvant therapy; ability to speak and understand Swedish; no previous cancer; no on-going psychiatric illness | scheduling, and ways to improve communication, methods derived from cognitive behavioural therapy [16]<br>· INS: Psychosocial support from a specially trained nurse, n=55<br>· IPS: Psychosocial support from a psychologist, n=57<br>· SC: Standard care, n=56.<br><br>Program duration::<br>· INS: 0-16 sessions (median=2); if ≥1 session: mean (median) duration being 172 (106) days.<br>· IPS: 0-23 sessions (median=3); if ≥1 session: mean (median) duration being 210 (178) days.<br><br>Variables included in analysis:<br>· Health utilities using the EORTC QLQ-C30 translated into the EQ-5D<br>· Intervention costs (including salary, a direct hospital component and an indirect allocation (i.e. supervision).<br>· Healthcare utilization during 2 years using medical records. | Costs:<br>· Costs (intervention+DH €18,670 for INS, for IPS and for S €25,800.<br><br>Economic evalua<br>· INS and IPS dominant compa (i.e. INS and IPS higher effect (i.e and lower costs comparison to S<br><br>Sensitivity analy<br>· Several one- performed and b results confirme<br>· Bootstrappin 1,000 replication estimate 95%CI |
| Hollingworth et al.[17], England | Clinical data<br>· Design: Unblinded, two-arm, parallel RCT, stratified by recruitment site.<br>· Setting: community-setting (2 sites)<br>· Sample size: 209 analyzed (220 allocated)<br>· Recruitment: October 2009-February 2011<br>· Data collection: At baseline and 1, 6 and 12-months. These were: Short-form of the Profile of Mood States (POMS), EORTC QLQ-C30; EQ5D; Trent Patient Views of Cancer Services Questionnaires (only at 6-months). Further healthcare utilization via medical records and intervention costs<br><br>Economic evaluation<br>· Type: CEA and NMB (using £30,000 per QALY); using primary clinical dataWTP using a threshold of £30,000 per QALY<br>· Perspective: National | · Cancer type: Patients starting outpatient radiotherapy or chemotherapy.<br>· Eligibility criteria:Age ≥18 and less than 85 years; primary solid tumor diagnosis within previous 12 months; outpatient external radiotherapy over a period of ≥2 weeks or outpatient chemotherapy of ≥two cylces; ability to read and communicate in English; not receiving neoadjuvant chemotherapy; and not diagnosed with ductal carcinoma in situ or skin carcinoma | Interventions: During 2nd week of radiotherapy/2nd cycle of chemotherapy, patients completed a face-to-face DT&PL meeting with a radiographer/nurse. A second DT&PL meeting could be arranged toward the end of therapy. The DT&PL forms the basis of a therapeutic conversation where concerns are identified and potential solutions are discussed including immediate staff actions (e.g. providing information), patient actions (e.g. using a self-help resource), and referral (e.g. psychological counselling). These action plans were recorded.<br>· IG: intervention group (allocated: n=112; included in intent-to-treat, n=106)<br>· SC; standard care (allocated: n=108; included in intent-to-treat, n=103).<br><br>Program duration:<br>· 2 meetings | Effects:<br>· There was n of an interventio the total POMS 12-months or ov 12-month follow<br>· Also no sign for QALY or any secondary outco<br><br>Costs:<br>· The interven £19 per patient, not offset by low subsequent hosp primary care or costs<br><br>Economic evalua<br>· NBM was £2 IG and £22,255 with Δ-915 (95% -2,398-569). The difference in net indicates that the intervention was cost-effective.<br><br>Sensitivity analy |

| | | | | |
|---|---|---|---|---|
| | Health Service perspective<br>· Cost year & monetary unit: 2010-2011, GBP<br>· Length of evaluation: 1-year<br><br>Funding: National Institute for Health Research, Research for Patient Benefit | | Variables included in CEA<br>· EQ5D (i.e. QALY)<br>· Intervention costs and direct healthcare costs | · Subgroup ar |
| Lemieux et al.[18], Canada | Clinical data<br>· Design: Blind two-arm RCT, stratified by center and the presence or absence of visceral metastases.<br>· Setting: 7 centers (but only 3 of the 7 for the economic evaluation)<br>· Sample size: economic analysis using only patients from 3-sites; n=125<br>· Recruitment: 1993-1998<br>· Data collection: at base line, 4, 8, and 12 months, using psychosocial questionnaires that included the Profile of Mood States and the pain and suffering scales used by Spiegel and Bloom and the EORTC QLQ-C30. Further, information on demographic characteristics and social support.[1]<br><br>Economic evaluation<br>· Type: CMA (for primary outcome) and CEA for mood and pain; using primary clinical data<br>· Perspective: Healthcare system<br>· Cost year & monetary unit: 2002-2003; CAN$<br>· Length of evaluation: Not stated, ~1-year (i.e. effect is measured at one-year, although length of follow-up is 722 days (IG) and 750 days (SC))<br><br>Funding: Canadian Institute of Health Research and the Canadian Breast Cancer Research Alliance. | · Cancer type: Breast cancer patients.<br>· Eligibility criteria: Women who had histologic confirmation of breast cancer at the time of diagnosis, if they had metastases outside of the breast and ipsilateral axilla, and if the treating physician most responsible for a woman's care gave consent[1] | Interventions: Weekly, 90-minute, therapist-led support group that adhered to principles of supportive-expressive (SE) therapy. Every four to six months, all the women received educational materials about breast cancer and its treatment, as well as about relaxation and nutrition.<br>· IG: intervention group, n=43<br>· SC: standard care & educational materials, n=82;<br><br>Program duration: Attending the group sessions for at least one year, or longer if the sessions continued to be of benefit<br><br>Variables included in CEA<br>· Survival (primary outcome)<br>· Secondary outcomes: psychosocial functioning, mood, pain,<br>· Intervention costs and direct healthcare costs | Effects:<br>· No significar difference betwe groups in surviva<br>· Statistically s benefits were fo psychological di (0.32 for POMS- pain (0.40 PAIN- the 1st year.<br><br>Costs:<br>· The control $2,169<br>· The mean co per patient was and $31,715 in respectively.<br><br>Economic evalu<br>· CMA: Differe between both ar equal to $3,526 significant), and intervention cost $2,169), there w statistically signi difference in res costs between I<br>· CEA: increm are CAN$5,550 CAN$4,309 for a size of change i and pain, respec<br><br>Sensitivity analy<br>· One- way S. change in result |
| Mandelblatt et al.[19], USA | Clinical data<br>· Design: Three-arm RCT, stratified by study site, whether the woman had received chemotherapy, and marital status (married/living as married v other); randomization based on a random | · Cancer type: Breast cancer patients<br>· Eligibility criteria: Women who had received surgery for invasive breast cancer of any size or | Interventions:: Videotape intervention and printed information (VID) vs psychological educational counselling , videotape and printed information (EDU)<br>· VID, n=128<br>· EDU, n=135 | Effects:<br>· EDU was no effective in incre energy or decrea distress than the arms.<br><br>Costs: |

| | | | | |
|---|---|---|---|---|
| | number-generated list.<br>· Setting: 3 sites<br>· Sample size: 388<br>· Recruitment: July 1999-June 2002<br>· Data collection: At baseline, 2-months (~4 to 6 weeks) after primary treatment; and at 6 and 12 months after intervention, using IES-R and MOS-SF36. Further included the baseline demographic and clinical data, the 2-month asses if in the IG women had watched the videotape. Further, every 3 months documenting health services. Research staff used weekly logs to record time and resources used to deliver intervention.<br><br>Economic evaluation<br>· Type: CEA; using primary clinical data<br>· Perspective: Societal perspective<br>· Cost year & monetary unit: Not stated (~2002); US$<br>· Length of evaluation: 6-month *'because this is the period of immediate transition and by 12 months, most women have adjusted to survivorship*'[19]<br><br>Funding: National Cancer Institute | nodal status, and who had no neoadjuvant chemotherapy, high-dose chemotherapy with bone marrow or stem-cell rescue or protracted reconstructive surgery, and who were able to read and write in English | · SC, standard care & printed information, n=125.<br><br>Program duration:<br>· VID: not stated<br>· EDU: 2 sessions, the first 80-minutes and the 2nd 2 weeks later by phone, 30-minutes<br><br>Variables included in CEA<br>· Distress and energy 6 months postintervention, using IES-R and MOS-SF36 vitality scale<br>· Intervention costs, healthcare utilization and patients time cost | · Intervention $11.30 for SC; $ VID and $134.47<br>· No significar differences in he costs over the 1 post-intervention study arm.<br><br>Economic evalua<br>· EDU was no effective than th others, but more expensive, thus by the two other<br>· ICER for VID was $7,275 per decreased distre $2.22 per unit improvement in respectively<br><br>Sensitivity analy<br>· One-way S.A<br>· No change c |

Other relevant studies

| Study ID, country | Method & Funding | Patient characteristics | Interventions & variables | Results and sensitiv analysis (S.A.) |
|---|---|---|---|---|
| Bradley et al.[20], England | Clinical data<br>· Design: prospective enriched cohort study. Patients from 3 of 12 hospitals formed IG. Patients from remaining hospitals (i.e.9) formed control group (SC). Matching criteria were: Age, lung function comorbidity and type of surgery<br>· Setting: 12 hospitals<br>· Sample size: 363<br>· Recruitment: Not stated<br>· Data collection: Demographic, clinical and healthcare cost data were collected pre-rehabilitation, | · Cancer type: Patients undergoing curative lung cancer surgery<br>· Eligibility criteria: Patient who was considered fit for curative lung cancer surgery by lung cancer multidisciplinary team at regional thoracic unit and following BTS guidelines. | Interventions: Program to optimize physical status, prepare for inpatient journey and support through recovery after surgery. Includes exercise classes, smoking cessation, dietary advice and patient education[5].<br>· IG: intervention group, n=58 (only 28 managed to attend the postoperative element)<br>· SC: standard care, n=305. | Effects:<br>· Patients in IG had Postoperative pulmon complications than SC 16%, p=0.21) and few readmissions (5 vs 14 p=0.12).<br><br>Costs:<br>· Total cost/patient estimated at £1284 co with £1528 for SC.<br><br>Economic evaluation<br>· IG compared to SC savings of £244/patien |

| | | | | |
|---|---|---|---|---|
| | post-rehabilitation presurgery, 4 weeks post-surgery and at 6 months.<br><br>Economic evaluation<br>· Type: CBA; using primary clinical data<br>· Perspective: Not stated (applied Healthcare payer)<br>· Cost year & monetary unit: 2010-2011; GBP<br>· Length of evaluation: Not stated (~ 6 months)<br><br>Funding: Nothing indicated | | Program duration: Not stated (~ 6 months)<br><br>Variables included in CBA<br>· Postoperative pulmonary complication; readmission; length of admission, … (expressed in natural units & as costs)<br>· Healthcare costs | Sensitivity analysis: N |
| Björnekl et al.[21], Sweden | Clinical data<br>· Design: RCT with two groups; randomization in blocks of four with closed envelops<br>· Setting: 1 hospital<br>· Sample size: 382<br>· Recruitment: April 2002-November 2007<br>· Data collection: Self-reported questionnaires at baseline (i.e. after randomization but before intervention), 2, 6 and 12-months after intervention. Family situation, occupation, sick leave and healthcare utilization<br><br>Economic evaluation<br>· Type: CBA; using primary clinical data<br>· Perspective: Societal<br>· Cost year & monetary unit: Not stated (trial period); SEK<br>· Length of evaluation: 1-year<br><br>Funding: Country Council of Västmanland, the Swedisch Social Insurance Agency, the Västmanland Research Fund against Cancer and the National Federation of Cancer and Traffic Injury | · Cancer type: Breast cancer.<br>· Eligibility criteria: Newly diagnosed primary breast cancer, no previous malignancy, the physical and mental capability to participate in group interventions and to fill in questionnaires and an expected survival time of more than 12 months. | Intervention<br>Information-based support program supplemented with relaxation, qi-gong and liberating dance taking place within 4-months of ending treatment; comprising a 7-day stay at a resort, where participants take part in the support program, followed by a 4-day follow-up 2-months after the initial visit.<br>· IG: Intervention group, n=191<br>· SC: Standard care, n=191<br><br>Program duration: ~2.5 months<br><br>Variables included in CEA<br>· Sick leave of patient (number of days & expressed as costs (i.e. productivity losses))<br>· Health care utilization (expressed in natural units & as costs) | Effects:<br>· No sign. difference the groups, neither for leave, nor the number medical specialists at after the intervention p<br><br>Costs:<br>· At all points in time costs for sick leave ar consumption of health for IG than SC and sig differences between g after 12-months. Addi of the intervention ma for the IG statistically significantly higher at measurement.<br>Economic evaluation :<br>· SC is dominant co IG. No sign. difference between groups and h costs for IG.<br><br>Sensitivity analysis: N |
| Tamminga et al.[22], the Netherlands | Clinical data<br>· Design: Two-arm RCT, randomization using computerized randomization program ALEA; stratified by return-to-work, age (<50 or ≥50 years) and cancer diagnosis. Patients, nurses and researchers are not blind to group assignment.<br>· Setting: 6 hospitals | · Cancer type: Breast and gynaecological cancer<br>· Eligibility criteria: Cancer patients between 18 and 60 years of age who had been treated with curative intent, had paid work, who | Interventions: included: 1) 4 meetings of 15 minutes each as part of the normal consulting hour to start early vocational rehabilitation carried out by an oncology nurse, social worker or nurse practitioner; 2) one meeting with the participant, the | Effects:<br>· Study failed to sho significant differences groups on return-to-w outcomes and qol.<br><br>Costs:<br>· Intervention costs €119/patient in IG<br>· The mean lost pro cost according to the l |

| | | | | |
|---|---|---|---|---|
| | · Sample size: 121 analyzed (133 allocated)<br>· Recruitment: May 2009-December 2010<br>· Data collection: At baseline, 6 and 12-month. Socio-demographic factors and prognostic factors for time until return-to-work were assessed at baseline only. Oucome measures (e.g. return-to-work and qol) and cancer treatments were assessed at all-time points. Intervention details were collected from nurses.<br><br>Economic evaluation<br>· Type: CMA (no CEA as no sign. differences between groups on outcomes measured); using primary clinical data<br>· Perspective: Societal<br>· Cost year & monetary unit: Not stated; €<br>· Length of evaluation: for economic evaluation, only first year follow-up<br><br>Funding: Stichting Instituut Gak | were on sick leave; were able to speak, read and write Dutch, had no severe mental disorder or other severe comorbidity. Treatment with curative intent was defined as an expected 1-year survival rate of approximately 80%. We excluded patients who were not sufficiently able to speak, read, or write Dutch, had a severe mental disorder or other severe comorbidity, and for whom the primary diagnosis of cancer had been made more than two months previously. | occupational physician, and the supervisor to make a return-to-work plan, and 3) three letters send to the occupational physician to enhance communication; two will be from the treating physician and one from the nurse.<br>· IG, intervention group, n=61 analyzed (65 allocated)<br>· SC, standard care, n=60 analyzed (68 allocated).<br><br>Program duration: Not stated<br><br>Variables included in CEA<br>· Rate of return-to work at one year of follow-up<br>· Number of days between the first day of sick leave and the first day at work sustained for at least 4 weeks.<br>· Qol using SF-36, including all subscales and VAS.<br>· Work ability using the first question of WAI.<br>· Impaired work functioning using WLQ<br>· Intervention costs<br>· Lost productivity costs and work adjustments costs<br>· No healthcare utilization | capital approach was IG and €38,968 in SC mean productivity cos according to the frictio approach was €14,03 €13,529 in SC.<br>· The mean work accommodations cost €2,975 and €3,025 in SC, respectively.<br>· These costs did no statistically between g<br><br>Economic evaluation<br>· No statistical signi effect and costs betwe groups.<br><br>Sensitivity analysis: N |

Abbreviations: CBA=cost-benefit analysis; CEA=cost-effectiveness analysis; CMA=cost-minimization analysis (i.e. no sign. difference in non-monetary effect measured, all other effects expressed in monetary units); CUA=cost-utility analysis; CG=control group (= standard care & additional rehabilitation measures); CWL=control waiting list; DHC=direct healthcare costs (i.e. cost for healthcare utilization); EORTC QLQ-C30= questionnaire developed to assess the quality of life of cancer patients by the European Organization for Research and Treatment of Cancer; EQ5D=Euroqol EQ-5D; IES-R=Revised Impact of Events Scale; IG=intervention group; : K10=Kessler Psychological distress Scale (K10); MOS-SF36= Medical Outcomes Study (MOS) Short-Form (SF) 36; PSA= probabilistic sensitivity analysis; RCT=randomized clinical trial; S.A.=sensitivity-analysis; SC=standard care group; SCNS/SCNS-LF59=Supportive Care Needs Survey Long Form (SCNS-LF59); QALY=Quality-adjusted life years; Qol=quality-of-life; VAS=Visual Analogue Scale; WAI= Work ability Index; WLQ=Work Limitation Questionnaire

**References**

1. Farquhar, M.C., et al., *Is a specialist breathlessness service more effective and cost-effective for patients with advanced cancer and their carers than standard care? Findings of a mixed-method randomised controlled trial.* BMC Med, 2014. **12**(1): p. 194.
2. Gordon, L.G., et al., *A cost-effectiveness analysis of two rehabilitation support services for women with breast cancer.* Breast Cancer Res Treat, 2005. **94**(2): p. 123-33.
3. Jones, L., et al., *Rehabilitation in advanced, progressive, recurrent cancer: a randomized controlled trial.* J Pain Symptom Manage, 2013. **46**(3): p. 315-325 e3.
4. Mourgues, C., et al., *Positive and cost-effectiveness effect of spa therapy on the resumption of occupational and non-occupational activities in women in breast cancer remission: a French multicentre randomised controlled trial.* Eur J Oncol Nurs, 2014. **18**(5): p. 505-11.
5. Kwiatkowski, F., et al., *Long term improved quality of life by a 2-week group physical and educational intervention shortly after breast cancer chemotherapy completion. Results of the 'Programme of Accompanying women after breast Cancer treatment completion in Thermal resorts' (PACThe) randomised clinical trial of 251 patients.* Eur J Cancer, 2013. **49**(7): p. 1530-8.
6. Round, J., B. Leurent, and L. Jones, *A cost-utility analysis of a rehabilitation service for people living with and beyond cancer.* BMC Health Serv Res, 2014. **14**(1): p. 558.
7. Mewes, J.C., et al., *Cost-effectiveness of cognitive behavioral therapy and physical exercise for alleviating treatment-induced menopausal symptoms in breast cancer patients.* J Cancer Surviv, 2014.
8. Duijts, S.F., et al., *Cognitive behavioral therapy and physical exercise for climacteric symptoms in breast cancer patients experiencing treatment-induced menopause: design of a multicenter trial.* BMC Womens Health, 2009. **9**: p. 15.
9. Duijts, S.F., et al., *Efficacy of cognitive behavioral therapy and physical exercise in alleviating treatment-induced menopausal symptoms in patients with breast cancer: results of a randomized, controlled, multicenter trial.* J Clin Oncol, 2012. **30**(33): p. 4124-33.
10. Drummond, M.F., et al., *Methods for the Economic Evaluation of Health Care Programs*2005, Oxford, UK: Oxford University Press.
11. Retel, V.P., et al., *A cost-effectiveness analysis of a preventive exercise program for patients with advanced head and neck cancer treated with concomitant chemo-radiotherapy.* BMC Cancer, 2011. **11**: p. 475.
12. Ackerstaff, A.H., et al., *First-year quality of life assessment of an intra-arterial (RADPLAT) versus intravenous chemoradiation phase III trial.* Head Neck, 2009. **31**(1): p. 77-84.
13. van der Molen, L., et al., *A randomized preventive rehabilitation trial in advanced head and neck cancer patients treated with chemoradiotherapy: feasibility, compliance, and short-term effects.* Dysphagia, 2011. **26**(2): p. 155-70.
14. Arving, C., et al., *Cost-utility analysis of individual psychosocial support interventions for breast cancer patients in a randomized controlled study.* Psychooncology, 2014. **23**(3): p. 251-8.
15. Arving, C., et al., *Individual psychosocial support for breast cancer patients: a randomized study of nurse versus psychologist interventions and standard care.* Cancer Nurs, 2007. **30**(3): p. E10-9.
16. Arving, C., et al., *Satisfaction, utilisation and perceived benefit of individual psychosocial support for breast cancer patients--a randomised study of nurse versus psychologist interventions.* Patient Educ Couns, 2006. **62**(2): p. 235-43.
17. Hollingworth, W., et al., *Are needs assessments cost effective in reducing distress among patients with cancer? A randomized controlled trial using the Distress Thermometer and Problem List.* J Clin Oncol, 2013. **31**(29): p. 3631-8.
18. Lemieux, J., et al., *Economic analysis of psychosocial group therapy in women with metastatic breast cancer.* Breast Cancer Res Treat, 2006. **100**(2): p. 183-90.
19. Mandelblatt, J.S., et al., *Economic evaluation alongside a clinical trial of psycho-educational interventions to improve adjustment to survivorship among patients with breast cancer.* J Clin Oncol, 2008. **26**(10): p. 1684-90.
20. Bradley, A., et al., *Pulmonary rehabilitation programme for patients undergoing curative lung cancer surgery.* Eur J Cardiothorac Surg, 2013. **44**(4): p. e266-71.
21. Bjorneklett, H.G., et al., *A randomized controlled trial of support group intervention after breast cancer treatment: results on sick leave, health care utilization and health economy.* Acta Oncol, 2013. **52**(1): p. 38-47.
22. Tamminga, S.J., et al., *Effectiveness of a hospital-based work support intervention for female cancer patients - a multi-centre randomised controlled trial.* PLoS One, 2013. **8**(5): p. e63271.

[1] CEA was already included in the 2010 literature review.
[2] Four core components were defined: 1.) Systematic clinical assessment (symptoms and treatments) by senior medical and nursing staff using the National Assessment and Care Planning Framework; 2.) Goal setting with the review date agreed between patient and clinician; referrals within the MDT on a case-by-case basis according to current need, for example, physical (exercise), psychological, and complementary therapies, comprising therapies such as: Art therapy; Bach flower remedies; counselling; social work; writing therapy; acupuncture; healing; homeopathy; hypnotherapy; Indian head message; relaxation group; reiki (simple form of healing); massage; physiotherapy/hydrotherapy; reflexology; Dietician/Nutritional therapy; 3.). Weekly MDT meeting to review patients, raise problems, and discuss offering additional available services according to individual need and preference; 4.) Patient/clinical discussion in clinics according to goal-setting timetable to review progress, set new goals, or agree on a discharge date.
[3] Round et al [7] and Jones et al. [4] is the same trial. Jones et al. presented the trial, effectiveness results and a first economic evaluation. The main objective of the Round paper was the economic evaluation. They perform probabilistic sensitivity analysis and scenario analyses whereby modelling also a longer follow-up period. Round and colleagues present detailed results of the economic evaluation.
[4] In the original trial presented in Duijts et al.[9,10] there were three intervention groups, namely CBT, PE and a combination of both (CBT+PE) vs CWL. But given that the combined CBT+PE treatment had no additional patient benefit above CBT or PE, and would always be more costly, this treatment option was not considered in the economic analysis by Mewes et al. [8]

[5] Educations sessions were delivered by lung cancer nurse specialists and physiotherapists, whereby addressing the diet, smoking, lifestyle change, disease process and diagnosis, inpatient expectations, preparation for discharge and home, pain management, basics of breathing and benefits of mobility, coughing and airway clearance as well as ways of dealing with symptoms while outside the hospital. Exercises: Patient attended local COPD rehabilitation exercise class twice weekly for 1 h, which included a combination of endurance and strength exercises as well as inspiratory muscle exercises. The patients in the intervention group trained up to 60% of their maximum exercise capacity guided by the BORG scale of breathlessness. The PRP was pragmatic in nature, permitting a degree of local adaptation. The exercise classes were delivered in hospital in two centers and in the community in one center, using individualized programs in two centers and group classes in the other. Postoperatively: Between 4 and 6 weeks post-hospital discharge, the intervention group rejoined the rehabilitation program twice weekly for up to 3 months and was then offered maintenance sessions once a week. All smokers were accelerated into locally available smoking cessation pathways. These included smoking advice, counselling and nicotine replacement therapy as appropriate. All patients had dietary advice by lung cancer nurse and a nutritional assessment, which included body mass index (BMI) as well as history of weight loss. If they met the criteria for dietary intervention (BMI <20, or 10% weight loss in the last 3 months), the patients were referred to a Macmillian dietician and received preoperative nutritional drink supplements, which continued for up to 3 months based on the subsequent postoperative nutritional assessment.

*32. Literature search cost-effectiveness*

# Key question : Are rehabilitation Interventions in cancer patients cost-effective?

## 1. Key question

*Are rehabilitation interventions in cancer patients cost-effective?*
A systematic review was done for the years 2012, 2013 and 2014. Papers published previous to 2012 were taken from the review of Mewes et al. (2012)

## 2. Search strategy

Search date: 5th February 2015.
Databases: Medline, Embase, NHS EED (see appendix for search strings).
Search limits:

- Publication date: 2012-2014
- English, Spanish, German, French, Italian or Dutch
- Adults (i.e. ≥ 18 years)
- Full paper available, no congress abstracts
- Economic evaluations comparing at least two alternatives, whereof one had to be a rehabilitation intervention
- Full economic evaluation, i.e. integration of cost differences and health differences
- Excluding economic evaluations considering only program costs and no other cost categories

- Excluding economic evaluations having no standard care to compare with

## 3. Search Results

**Figure 1. Overall search results.**

### a. Excluded studies

2,112 hits were screened on title and abstract (Figure 1). Of these 28 were double, and another 2,052 were excluded based on title and abstract, mainly because:

1. No economic evaluation:g. only effectiveness, study protocol, etc.
2. Other population: i.e.no cancer patients
3. No rehabilitation intervention: e.g. screening, vaccination, …

Of the remaining 32 papers, the full-text was retrieved. Based on the full-text, an additional 22 papers were excluded. Table 1 provides an overview of these excluded studies.
Of the 6 identified papers by Mewes et al. (2012), - a review -, 2 studies were excluded because the control group had active interventions. Therefore a comparison with standard care would not be possible. These two studies were the following:

- Haines TP, Sinnamon P, Wetzig NG, et al. Multimodal exercise improves quality of life of women being treated for breast cancer, but at what cost? Randomized trial with economic evaluation. Breast Cancer Res Treat 2010;124:163-75. (Identified via Mewes et al. (2012))

- Sabariego C, Brach M, Herschbach P, Berg P, Stucki G. Cost-effectiveness of cognitive-behavioral group therapy for dysfunctional fear of progression in cancer patients. Eur J Health Econ 2011;12:489-97. (Identified via Mewes et al. (2012))

Of the 14 identified papers, 3 additional studies were excluded because no health effects were considered in these evaluations. So no integration of cost differences and health differences was possible. These three

studies were the following:

- Bjorneklett HG, Rosenblad A, Lindemalm C, et al. A randomized controlled trial of support group intervention after breast cancer treatment: results on sick leave, health care utilization and health economy. Acta Oncol 2013;52:38-47.
- Bradley A, Marshall A, Stonehewer L, et al. Pulmonary rehabilitation programme for patients undergoing curative lung cancer surgery. Eur J Cardiothorac Surg 2013;44:e266-71.

- Tamminga SJ, Verbeek JH, Bos MM, et al. Effectiveness of a hospital-based work support intervention for female cancer patients - a multi-centre randomised controlled trial. PLoS One 2013;8:e63271.

## b. Included studies

The following 11 papers were included:

- Arving C, Brandberg Y, Feldman I, Johansson B, Glimelius B. Cost-utility analysis of individual psychosocial support interventions for breast cancer patients in a randomized controlled study. Psychooncology 2014;23:251-8.
- Farquhar MC, Prevost A, McCrone P, et al. Is a specialist breathlessness service more effective and cost-effective for patients with advanced cancer and their carers than standard care? Findings of a mixed-method randomised controlled trial. BMC Med 2014;12:194.
- Gordon LG, Scuffham P, Battistutta D, Graves N, Tweeddale M, Newman B. A cost-effectiveness analysis of two rehabilitation support services for women with breast cancer. Breast Cancer Res Treat 2005;94:123-33. (Identified via Mewes et al. (2012))
- Hollingworth W, Metcalfe C, Mancero S, et al. Are needs assessments cost effective in reducing distress among patients with cancer? A randomized controlled trial using the Distress Thermometer and Problem List. J Clin Oncol 2013;31:3631-8.
- Jones L, Fitzgerald G, Leurent B, et al. Rehabilitation in advanced, progressive, recurrent cancer: a randomized controlled trial. J Pain Symptom Manage 2013; 46:315-25 e3.
- Lemieux J, Topp A, Chappell H, Ennis M, Goodwin PJ. Economic analysis of psychosocial group therapy in women with metastatic breast cancer. Breast Cancer Res Treat 2006;100:183-90. (Identified via Mewes et al. (2012))
- Mandelblatt JS, Cullen J, Lawrence WF, et al. Economic evaluation alongside a clinical trial of psycho-educational interventions to improve adjustment to survivorship among patients with breast cancer. J Clin Oncol 2008;26:1684-90. (Identified via Mewes et al. (2012))
- Mewes JC, Steuten LM, Duijts SF, et al. Cost-effectiveness of cognitive behavioral therapy and physical exercise for alleviating treatment-induced menopausal symptoms in breast cancer patients. J Cancer Surviv 2014 [Epub Date 2014/09/03].
- Mourgues C, Gerbaud L, Leger S, et al. Positive and cost-effectiveness effect of spa therapy on the resumption of occupational and non-occupational activities in women in breast cancer remission: a French multicentre randomised controlled trial. Eur J Oncol Nurs 2014;18:505-11.
- Retel VP, van der Molen L, Hilgers FJ, et al. A cost-effectiveness analysis of a preventive exercise program for patients with advanced head and neck cancer treated with concomitant chemo-radiotherapy. BMC cancer 2011;11:475. (Identified via Mewes et al. (2012))

- Round J, Leurent B, Jones L. A cost-utility analysis of a rehabilitation service for people living with and beyond cancer. BMC Health Serv Res 2014;14:558.

**Table 1. Key question 1: overview of excluded studies based on full-text evaluation.**

| Author | Reference | Title | Reason |
|---|---|---|---|
| Badger TA et al. | Psychooncology 2013;22:1035-42 | Telephone-delivered health education and interpersonal counseling improve quality of life for Latinas with breast cancer and their supportive partners. | Excluded becaus program costs |
| Befort CA et al. | Contemp Clin Trials | Protocol and recruitment results from a | No economic eva |

| | | | |
|---|---|---|---|
| | 2014;37:261-71. | randomized controlled trial comparing group phone-based versus newsletter interventions for weight loss maintenance among rural breast cancer survivors. | protocol and first |
| Belkora J et al. | Patient Educ Couns 2012;89:134-42. | Decision support by telephone: randomized controlled trial in a rural community setting. | Excluded becaus program costs |
| Bilir SP et al. | Am J Manag Care 2012;18:234-41. | Economic benefits of BIS-aided assessment of post-BC lymphedema in the United States. | No economic eva impact analysis w based on literatu |
| Broderick JM et al. | Physiotherapy 2014;100:182-4. | Calculating the costs of an 8-week, physiotherapy-led exercise intervention in deconditioned cancer survivors in the early survivorship period (the PEACH trial). | Excluded becaus program costs |
| Brown C et al. | Clin J Oncol Nurs 2012;16:15-7. | Partnership and empowerment program: a model for patient-centered, comprehensive, and cost-effective care. | No economic eva their program |
| Cnossen IC et al. | J Med Internet Res 2014;16:e74. | Multimodal guided self-help exercise program to prevent speech, swallowing, and shoulder problems among head and neck cancer patients: a feasibility study. | No economic eva study and in futur (cost)-effectivene carried out |
| Gaertner J et al. | Health policy 2013;109:311-8. | Inpatient palliative care: a nationwide analysis. | No rehabilitation matched cohort s costs as registere cases with and w palliative care. |
| Kaptein AA. | Ned Tijdschr Geneeskd 2014;159:A8504. | [Cognitive behavioural therapy for breast cancer: cost-effectiveness demonstrated]. | “Kind of review”. the findings of Me study identified b included in the cu |
| Khan F et al. | Cochrane Database Syst Rev 2012;12:CD009553. | Multidisciplinary rehabilitation for follow-up of women treated for breast cancer. | Review of multidi rehabilitation, wa relevant referenc |
| Klinger CA et al. | Palliat Med 2013;27:115-22. | Resource utilization and cost analyses of home-based palliative care service provision: the Niagara West End-of-Life Shared-Care Project. | No economic eva the cost of palliat |
| Leach HJ et al. | Curr Oncol 2014;21:267-71. | Design and implementation of a community-based exercise program for breast cancer patients. | No economic eva rehabilitation prog |
| Lopez-Acevedo M et al. | Gynecol Oncol 2013;131:215-21. | Palliative and hospice care in gynecologic cancer: a review. | Review, was sea references. |
| Mewes JC et al. | Oncologist 2012;17:1581-93. | Effectiveness of multidimensional cancer survivor rehabilitation and cost-effectiveness of cancer rehabilitation in general: a systematic review. | Review, was sea references, in tot previous to 2012 included in the cu 1). |
| Pompili A et al.. | Neurosurg Focus 2014;37:E5 | Home palliative care and end of life issues in glioblastoma multiforme: results and comments from a homogeneous cohort of patients. | No economic eva references |
| Silver JK et al. | Am J Phys Med Rehabil 2013;92:715-27. | Cancer prehabilitation: an opportunity to decrease treatment-related morbidity, increase cancer treatment options, and improve physical and psychological health outcomes. | Kind of review. N |
| Spahn G et al. | Integr Cancer Ther 2013;12:291-300. | Can a multimodal mind-body program enhance the treatment effects of physical activity in breast cancer survivors with chronic tumor-associated fatigue? | No economic eva reported |
| Stigt JA at al. | J Thorac Oncol 2013;8:214-21. | A randomized controlled trial of postthoracotomy | No economic eva |

| | | | |
|---|---|---|---|
| | | pulmonary rehabilitation in patients with resectable lung cancer. | quality-of-life repo |
| Wagner et al. | J Clin Oncol 2014;32:12-8. | Nurse navigators in early cancer care: a randomized, controlled trial. | No rehabilitation programs develo barriers that low i face gaining time screening and dia |
| Walker J et al. | Lancet Oncol 2014;15:1168-76. | Integrated collaborative care for major depression comorbid with a poor prognosis cancer (SMaRT Oncology-3): a multicentre randomised controlled trial in patients with lung cancer. | No economic eva |
| Wissinger E et al. | PharmacoEconomics 2014;32:865-82. | The economic burden of head and neck cancer: a systematic literature review. | Review, no releva |
| Zhang AY et al. | Asia-Pacific Journal of Clinical Oncology 2014;10:258-9. | Cost-effectiveness of an intervention to persistent urinary incontinence in prostate cancer patients: A call for system change. | Congress abstrac evaluation of an ' intervention (i.e. |

# Search strings

## 1. medline

#6,"Search #5 AND #4",1942

#5. “Search ("2012/01/01"[Date - Publication] : "2015/01/01"[Date - Publication])”, 3107610

#4," Search #1 AND #2 AND #3", 7426

#3,"Search ((((((((((Econom*[Title/Abstract]) OR costs[Title/Abstract]) OR cost[Title/Abstract]) OR cost-effectiveness analysis[Title/Abstract]) OR cost-effectiveness[Title/Abstract]) OR cost-utility[Title/Abstract]) OR cost-benefit[Title/Abstract]) OR cost analysis[Title/Abstract]) OR budget impact[Title/Abstract]) OR budget-impact[Title/Abstract]) OR budget impact analysis[Title/Abstract]) OR costs[MeSH Terms]) OR cost analysis[MeSH Terms]", 564723

#2,"Search ((((((Cancer*[Title/Abstract]) OR tumor[Title/Abstract]) OR tumors[Title/Abstract]) OR oncolog*[Title/Abstract]) OR carcinoma*[Title/Abstract])) OR neoplasms[MeSH Terms]", 3139832

#1,"Search ((((((((((((((((((((((((Rehabilitation[Title/Abstract]) OR multicomponent[Title/Abstract]) OR multidimensional[Title/Abstract]) OR multifaceted[Title/Abstract]) OR multitreatment[Title/Abstract]) OR multimodal[Title/Abstract]) OR complex[Title/Abstract]) OR program[Title/Abstract]) OR exercise[Title/Abstract]) OR physical activities[Title/Abstract]) OR physical exercise[Title/Abstract]) OR exercise training[Title/Abstract]) OR exercise therapy[Title/Abstract]) OR muscle stretching[Title/Abstract]) OR resistance training[Title/Abstract]) OR physiotherapy[Title/Abstract]) OR physical therapy[Title/Abstract]) OR cognitive therapy[Title/Abstract]) OR return-to-work[Title/Abstract]) OR reintegration[Title/Abstract]) OR back to work[Title/Abstract]) OR vocational rehabilitation[Title/Abstract]) OR occupational rehabilitation[Title/Abstract]) OR psychosocial[Title/Abstract]) OR support [Title/Abstract]) OR work place[Title/Abstract]", 2103240

## 2. EMBASE

| No. | Query | Results |
|---|---|---|
| #5 | #1 AND #2 AND #3 AND ([dutch]/lim OR [english]/lim OR [french]/lim OR [german]/lim OR [italian]/lim OR [spanish]/lim) AND [humans]/lim AND [embase]/lim AND [2012-2014]/py | 170 |
| #4 | #3 AND #2 AND #1 | 401 |
| #3 | 'economic' OR 'costs and cost analysis'/mj OR 'cost'/mj OR 'cost effectiveness analysis'/mj OR 'cost effectiveness'/mj OR 'cost utility analysis'/mj OR 'cost benefit analysis'/mj OR 'cost analysis'/mj OR 'budget impact analysis' AND [humans]/lim AND [embase]/lim | 129910 |
| #2 | 'neoplasm'/mj OR 'neoplas' OR 'cancer'/mj OR 'tumor'/mj OR 'tumors' OR 'oncolog' OR 'carcinoma'/mj AND [humans]/lim AND [embase]/lim | 413172 |
| #1 | 'rehabilitation'/mj OR 'multidimensional' OR 'multimodal' OR 'complex' OR 'program' OR 'exercise'/mj OR 'physical activity'/mj OR 'physical exercise'/mj OR 'exercise training'/mj OR 'exercise therapy'/mj OR 'kinesiotherapy'/mj OR 'muscle stretching'/mj OR 'resistance training'/mj OR 'physiotherapy'/mj OR 'physical therapy'/mj OR 'cognitive therapy'/mj OR 'return to work'/mj OR 'reintegration' OR 'vocational rehabilitation'/mj OR 'occupational rehabilitation'/mj OR 'psychosocial’/mj OR 'support’/mj AND [humans]/lim AND [embase]/lim | 1798244 |

# 3. NHS EEd

Combine selections with AND OR NOT | Select all | Clear selections | Clear history

| Line | Search | Hits | |
|---|---|---|---|
| 1 | ((neoplas):TI OR (tumors):TI OR (oncolog):TI) and ((Economic evaluation:ZDT and Bibliographic:ZPS) OR (Economic evaluation:ZDT and Abstract:ZPS)) IN NHSEED FROM 2012 TO 2014 | 8 | Delete |
| 2 | ((cancer):TI OR (cancers):TI OR (carcinoma):TI) and ((Economic evaluation:ZDT and Bibliographic:ZPS) OR (Economic evaluation:ZDT and Abstract:ZPS)) IN NHSEED FROM 2012 TO 2014 | 454 | Delete |
| 3 | ((tumor):TI OR (neoplasma):TI) and ((Economic evaluation:ZDT and Bibliographic:ZPS) OR (Economic evaluation:ZDT and Abstract:ZPS)) IN NHSEED FROM 2012 TO 2014 | 11 | Delete |
| 4 | #1 OR #2 OR #3 | 470 | Delete |
| 5 | ((support):TI OR (psychosocial):TI OR (rehabilitation):TI) and ((Economic evaluation:ZDT and Bibliographic:ZPS) OR (Economic evaluation:ZDT and Abstract:ZPS)) IN NHSEED FROM 2012 TO 2014 | 68 | Delete |
| 6 | ((multidimensional):TI OR (multimodal):TI OR (complex):TI) and ((Economic evaluation:ZDT and Bibliographic:ZPS) OR (Economic evaluation:ZDT and Abstract:ZPS)) IN NHSEED FROM 2012 TO 2014 | 15 | Delete |
| 7 | ((exercise):TI OR (physical):TI OR (training):TI) and ((Economic evaluation:ZDT and Bibliographic:ZPS) OR (Economic evaluation:ZDT and Abstract:ZPS)) IN NHSEED FROM 2012 TO 2014 | 64 | Delete |
| 8 | ((therapy):TI OR (kinesiotherapy):TI OR (muscle stretching):TI) and ((Economic evaluation:ZDT and Bibliographic:ZPS) OR (Economic evaluation:ZDT and Abstract:ZPS)) IN NHSEED FROM 2012 TO 2014 | 323 | Delete |
| 9 | ((resistance training):TI OR (physiotherapy):TI OR (Physical therapy):TI) and ((Economic evaluation:ZDT and Bibliographic:ZPS) OR (Economic evaluation:ZDT and Abstract:ZPS)) IN NHSEED FROM 2012 TO 2014 | 5 | Delete |
| 10 | ((education):TI OR (diet):TI) and ((Economic evaluation:ZDT and Bibliographic:ZPS) OR (Economic evaluation:ZDT and Abstract:ZPS)) IN NHSEED FROM 2012 TO 2014 | 33 | Delete |
| 11 | #5 OR #6 OR #7 OR #8 OR #9 OR #10 | 489 | Delete |
| 12 | #4 AND #11 | 39 | Delete |

*35. Decision tree  Specialised medical rehabilitation in oncology*

# Notes

Indeling van bewijs

Uniforme indeling van de literatuur naar mate van bewijs en bepaling van het niveau van het advies:

**Tabel 1a Mate van bewijs bij studies betreffende interventies en behandeling**

| | |
|---|---|
| A1 | Meta-analyses die ten minste enkele gerandomiseerde onderzoeken van A2-niveau betreffen, waarbij de resultaten van afzonderlijke onderzoeken consistent zijn. |
| A2 | Gerandomiseerd vergelijkend klinisch onderzoek van goede kwaliteit (gerandomiseerde, dubbelblind gecontroleerde trials) van voldoende omvang en consistentie. |
| B | Gerandomiseerde klinische trials van matige kwaliteit of onvoldoende omvang of ander vergelijkend onderzoek (niet-gerandomiseerd, cohortstudies, case-controlstudies). |
| C | Niet-vergelijkend onderzoek. |
| D | De mening van de deskundigen. |

**Tabel 1b: Mate van bewijs bij diagnostische tests**

| | |
|---|---|
| A1 | Onderzoek naar effecten van diagnostiek op klinische uitkomsten bij een prospectief gevolgde goedgedefinieerde patientengroep met een tevoren gedefinieerd beleid op grond van te onderzoeken testuitslagen, of besliskundig onderzoek naar de effecten van diagnostiek op klinische uitkomsten, waarbij resultaten van onderzoek van A2-niveau als basis wordt gebruikt en voldoende rekening wordt gehouden met onderlinge afhankelijkheid van diagnostische tests. |
| A2 | Onderzoek ten opzichte van een referentietest, waarbij vooraf criteria zijn gedefinieerd voor de te onderzoeken test en voor een referentietest, met een goede beschrijving van de test en de onderzochte klinische populatie: het moet een voldoende grote serie van opeenvolgende patienten betreffen, er moet gebruik gemaakt zijn van tevoren gedefinieerde afkapwaarden, en de resultaten van de test en de gouden standaard moeten onafhankelijk zijn beoordeeld. Bij situaties waarbij multipele diagnostische tests een rol spelen is er in principe een onderlinge afhankelijkheid en dient de analyse hierop te zijn aangepast, bijvoorbeeld met logistische regressie. |
| B | Vergelijking met een referentietest, beschrijving van de onderzochte test en van de onderzochte populatie, maar niet de kenmerken die verder onder niveau A staan genoemd. |
| C | Niet-vergelijkend onderzoek. |
| D | De mening van de deskundigen. |

**Tabel 1c: Niveau en formulering van conclusies**

| Niveau | Niveau van onderzoek moet minstens zijn | Voorbeeld conclusie (C) en advies (A) |
|---|---|---|
| 1 | Ondersteund door ten minste twee onafhankelijk van elkaar uitgevoerde onderzoeken van niveau A. | C: het is aangetoond dat“<br>A: men dient“ |
| 2 | Ondersteund door ten minste twee onafhankelijk van elkaar uitgevoerde onderzoeken van niveau B. | C: het is aannemelijk“<br>A: men zou “moeten“ |
| 3 | Niet ondersteund door voldoende onderzoek van niveau A of B | C: er zijn aanwijzingen dat“<br>A: men kan“ |
| 4 | Advies op grond van de mening van de werkgroepleden, niveau D | C, A: de werkgroep is van mening dat“ |

Tabel 2: Literatuurclassificatie

Zoekvolgorde van artikelen:

1 meta-analyse van prospectieve RCT s
2 prospectief onderzoek in RCT
3 prospectief opgezette cohort
a: multicenter-dataverzameling
b: monocenter-dataverzameling
case control studies
4 retrospectieve case pooling
a: multicenter
b: monocenter
case reports (en kleine aantallen patienten)
expert opinion

**Indeling van de onderbouwing naar de mate van bewijskracht**
**Voor artikelen betreffende interventie**
A1 systematische reviews die ten minste enkele onderzoeken van A2-niveau betreffen, waarbij de resultaten van de afzonderlijke onderzoeken consistent zijn;
A2 gerandomiseerd vergelijkend klinisch onderzoek van goede kwaliteit van voldoende omvang en consistentie;
B gerandomiseerde klinische trials van matige kwaliteit of onvoldoende omvang of ander vergelijkend onderzoek (niet-gerandomiseerd, vergelijkend cohortonderzoek, patiëntcontroleonderzoek);
C niet-vergelijkend onderzoek;
D mening van deskundigen, bijvoorbeeld de werkgroepleden.

**Voor artikelen betreffende diagnostiek**
A1 onderzoek naar de effecten van diagnostiek op klinische uitkomsten bij een prospectief gevolgde goed gedefinieerde patiëntengroep met een tevoren gedefinieerd beleid op grond van de te onderzoeken testuitslagen, of besliskundig onderzoek naar de effecten van diagnostiek op klinische uitkomsten, waarbij resultaten van onderzoek van A2-niveau als basis worden gebruikt en voldoende rekening wordt gehouden met onderlinge afhankelijkheid van diagnostische tests;
A2 onderzoek ten opzichte van een referentietest, waarbij van tevoren criteria zijn gedefinieerd voor de te onderzoeken test en voor een referentietest, met een goede beschrijving van de test en de onderzochte klinische populatie; het moet een voldoende grote serie van opeenvolgende patiënten betreffen, er moet gebruik zijn gemaakt van tevoren gedefinieerde afkapwaarden en de resultaten van de test en de gouden standaard moeten onafhankelijk zijn beoordeeld. Bij situaties waarbij multipele, diagnostische tests een rol spelen, is er in principe een onderlinge afhankelijkheid en dient de analyse hierop te zijn aangepast, bijvoorbeeld met logistische regressie;
B vergelijking met een referentietest, beschrijving van de onderzochte test en populatie, maar niet de kenmerken die verder onder niveau A staan genoemd;
C niet-vergelijkend onderzoek;
D mening van deskundigen, bijvoorbeeld de werkgroepleden.

**Niveau van bewijs van de conclusies**
1 ten minste één systematische review (A1) of twee onafhankelijk van elkaar uitgevoerde onderzoeken van niveau A2;
2 ten minste twee onafhankelijk van elkaar uitgevoerde onderzoeken van niveau B;
3 ten minste één onderzoek van niveau A2, B of C;
4 mening van deskundigen, bijvoorbeeld de werkgroepleden.

De beschrijving en beoordeling van de verschillende artikelen staan in de verschillende teksten onder het kopje Wetenschappelijke onderbouwing . Het wetenschappelijk bewijs is samengevat in een Conclusie , waarbij het niveau van het relevantste bewijs is weergegeven.

**Totstandkoming van de aanbevelingen**
Voor het komen tot een aanbeveling zijn er naast het wetenschappelijk bewijs vaak andere aspecten van belang, bijvoorbeeld: patiëntenvoorkeuren, beschikbaarheid van speciale technieken of expertise, organisatorische aspecten, maatschappelijke consequenties of kosten. Deze aspecten worden besproken na de Conclusie . Hierin wordt de conclusie op basis van de literatuur geplaatst in de context van de

dagelijkse praktijk en vindt een afweging plaats van de voor- en nadelen van de verschillende beleidsopties. De uiteindelijk geformuleerde aanbeveling is het resultaat van het beschikbare bewijs in combinatie met deze overwegingen.

Het volgen van deze procedure en het opstellen van de richtlijn in dit format heeft als doel de transparantie van de richtlijn te verhogen. Het biedt ruimte voor een efficiënte discussie tijdens de werkgroepvergaderingen en vergroot bovendien de helderheid voor de gebruiker van de richtlijn.

**Tabel 1**
**Indeling van de literatuur naar de mate van bewijskracht: voor artikelen betreffende interventie (preventie of therapie)**

| | |
|---|---|
| A1 | systematische reviews die ten minste enkele onderzoeken van A2-niveau betreffen, waarbij de resultaten van afzonderlijke onderzoeken consistent zijn |
| A2 | gerandomiseerd vergelijkend klinisch onderzoek van goede kwaliteit (gerandomiseerde, dubbelblind gecontroleerde trials) van voldoende omvang en consistentie |
| B | gerandomiseerde klinische trials van matige kwaliteit of onvoldoende omvang of ander vergelijkend onderzoek (niet-gerandomiseerd, vergelijkend cohortonderzoek, patiëntcontroleonderzoek) |
| C | niet-vergelijkend onderzoek |
| D | mening van deskundigen, bijvoorbeeld de werkgroepleden |

**Tabel 2**
**Indeling van de literatuur naar de mate van bewijskracht: voor artikelen betreffende diagnostiek**

| | |
|---|---|
| A1 | onderzoek naar de effecten van diagnostiek op klinische uitkomsten bij een prospectief gevolgde goed gedefinieerde patiëntengroep met een tevoren gedefinieerd beleid op grond van de te onderzoeken testuitslagen, of besliskundig onderzoek naar de effecten van diagnostiek op klinische uitkomsten, waarbij resultaten van onderzoek van A2-niveau als basis worden gebruikt en voldoende rekening wordt gehouden met onderlinge afhankelijkheid van diagnostische tests |
| A2 | onderzoek ten opzichte van een referentietest, waarbij van tevoren criteria zijn gedefinieerd voor de te onderzoeken test en voor een referentietest, met een goede beschrijving van de test en de onderzochte klinische populatie; het moet een voldoende grote serie van opeenvolgende patiënten betreffen, er moet gebruik gemaakt zijn van tevoren gedefinieerde afkapwaarden en de resultaten van de test en de 'gouden standaard' moeten onafhankelijk zijn beoordeeld. Bij situaties waarbij multipele, diagnostische tests een rol spelen, is er in principe een onderlinge afhankelijkheid en dient de analyse hierop te zijn aangepast, bijvoorbeeld met logistische regressie |
| B | vergelijking met een referentietest, beschrijving van de onderzochte test en populatie, maar niet de kenmerken die verder onder niveau A staan genoemd |
| C | niet-vergelijkend onderzoek |
| D | mening van deskundigen, bijvoorbeeld de werkgroepleden |

**Tabel 3**
**Niveau van bewijs van de conclusies**

| | |
|---|---|
| 1 | één systematische review (A1) of ten minste twee onafhankelijk van elkaar uitgevoerde onderzoeken van niveau A2 |
| 2 | ten minste twee onafhankelijk van elkaar uitgevoerde onderzoeken van niveau B |
| 3 | één onderzoek van niveau A2 of B of onderzoek van niveau C |
| 4 | mening van deskundigen, bijvoorbeeld de werkgroepleden |

**Voor artikelen betreffende interventie (preventie of therapie)**

| | |
|---|---|
| A1 | systematische reviews die ten minste enkele onderzoeken van A2-niveau betreffen, waarbij de resultaten van afzonderlijke onderzoeken consistent zijn |
| A2 | gerandomiseerd, vergelijkend, klinisch onderzoek van goede kwaliteit van voldoende omvang en consistentie |
| B | gerandomiseerde, klinische trials van matige kwaliteit of onvoldoende omvang of ander vergelijkend onderzoek (niet-gerandomiseerd, vergelijkend cohortonderzoek, patiënt-controle-onderzoek) |
| C | niet-vergelijkend onderzoek |
| D | mening van deskundigen, bijvoorbeeld de werkgroepleden |

**Voor artikelen betreffende diagnostiek**

| | |
|---|---|
| A1 | onderzoek naar de effecten van diagnostiek op klinische uitkomsten bij een prospectief gevolgde, goed gedefinieerde patiëntengroep met een tevoren gedefinieerd beleid op grond van de te onderzoeken testuitslagen, of besliskundig onderzoek naar de effecten van diagnostiek op klinische uitkomsten, waarbij resultaten van onderzoek van A2-niveau als basis worden gebruikt en voldoende rekening wordt gehouden met onderlinge afhankelijkheid van diagnostische tests |
| A2 | onderzoek ten opzichte van een referentietest, waarbij van tevoren criteria zijn gedefinieerd voor de te onderzoeken test en voor een referentietest, met een goede beschrijving van de test en de onderzochte klinische populatie; het moet een voldoende grote serie van opeenvolgende patiënten betreffen, er moet gebruikgemaakt zijn van tevoren gedefinieerde afkapwaarden en de resultaten van de test en de 'gouden standaard' moeten onafhankelijk zijn beoordeeld. Bij situaties waarbij multipele, diagnostische tests een rol spelen, is er in principe een onderlinge afhankelijkheid en dient de analyse hierop te zijn aangepast, bijvoorbeeld met logistische regressie |
| B | vergelijking met een referentietest, beschrijving van de onderzochte test en populatie, maar niet de kenmerken die verder onder niveau A staan genoemd |
| C | niet-vergelijkend onderzoek |
| D | mening van deskundigen, bijvoorbeeld de werkgroepleden |

**Voor artikelen betreffende schade of bijwerkingen, etiologe, prognose***

| | |
|---|---|
| A1 | systematische reviews die ten minste enkele onderzoeken van A2-niveau betreffen, waarbij de resultaten van afzonderlijke onderzoeken consistent zijn |
| A2 | Prospectief cohort onderzoek van voldoende omvang en follow-up, waarbij adequaat gecontroleerd is voor confounding en selectieve follow-up voldoende is uitgesloten. |
| B | Prospectief cohort onderzoek, mar niet met alle kenmerken als genoemde onder A2 of retrospectief cohort onderzoek of patiënt-controle-onderzoek |
| C | niet-vergelijkend onderzoek |
| D | mening van deskundigen, bijvoorbeeld de werkgroepleden |

*deze classificatie is alleen van toepassing in situaties waarin om ethische of andere redenen gecontroleerde trails niet mogelijk zijn. Zijn die wel mogelijk dan geldt de classificaties voor interventies.

**Niveau van bewijs van de conclusies**

| | |
|---|---|
| 1 | tenminste één systematische review (A1) of twee onafhankelijk van elkaar uitgevoerde onderzoeken van niveau A1 of A2 |
| 2 | 1 onderzoek van niveau A2 of tenminste twee onafhankelijk van elkaar uitgevoerde onderzoeken van niveau B |
| 3 | tenminste één onderzoek van niveau B of C |

| | |
|---|---|
| 4 | mening van deskundigen, bijvoorbeeld de werkgroepleden |