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# Cancer-related fatigue: a review of nursing interventions

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**F**atigue, specifically the fatigue experienced by the person who has cancer, is a common and distressing symptom that affects between 80–90% of cancer patients (Ream and Richardson, 1999; Walsh et al 2000) and up to 99% of patients following radiotherapy or chemotherapy (Radbruch et al, 2008). It is also a persistent source of concern for the family of the affected individual, their carers and health professionals.

The effects of cancer-related fatigue are multi-dimensional and can interfere with every aspect of a person's life, including: independence, muscle strength, decisions about wanting to continue with cancer treatment, mood, concentration, perception, work, caring for the family, social relationships, sex and enjoying life in general. Moreover, the multiple and varied effects of fatigue do not necessarily dissipate once cancer treatment has been completed. It is now increasingly being recognized that even individuals who are disease free might experience prolonged and persistent feelings of extreme tiredness and lethargy for months and even years following primary cancer treatment (Bower et al, 2006; Young and White,

2006; Servaes et al, 2007; Rosman, 2009). However, more can be done to help people in the community who suffer from cancer-related fatigue.

## What is cancer-related fatigue?

There are numerous definitions of cancer-related fatigue presented in the literature. There is a consensus that fatigue is a multidimensional phenomenon that is self-perceived (subjective) and includes physical, emotional, cognitive and behavioural components. It is unrelenting, can disrupt daily life, fosters helplessness and may culminate in despair (Smets et al, 1995; Ream and Richardson, 1996; Schwartz, 1998).

Practically, it is distinguished from the more familiar experience of tiredness because it is not relieved easily by addressing a deficiency such as sleep, food or water. It is an individual, complex and subjective experience that is prolonged, relentless, at times overwhelming and may vary in intensity and duration.

## Conceptual constructs of fatigue

Bartley and Chute (1947) described fatigue as an early indicator of the body's lack of resources to cope with the demands placed upon it. Derivative views hold true today by a procession of theorists who conceptualize fatigue as a way to provide depth to understanding the symptom. For example, Grandjean (1968) proposed a biofeedback process that was based on a series of actions that were responsible for activating and inhibiting neural pathways that in turn affected consciousness, perception and thinking. Winningham's Psychobiological-Entropy Hypothesis places an emphasis on the balance between restorative rest and restorative activity (Nail, 1997). Piper's Integrated Fatigue Model (Piper et al, 1998) emphasized the view that fatigue is multi-dimensional and should therefore be assessed and treated as such. Most recently, a reconceptualization of the complexity of fatigue inspired by the contribution of Selye (1956) and Cameron (1973), has been presented by Olson, a contemporary researcher. Olson has systematically and empirically developed the Fatigue Adaptation Model and Edmonton Fatigue Framework (EFF) (Olson, 2007; Olson et al, 2007; 2008). This advancement conceptualizes fatigue as a stress response observable in the decline of the person's condition according to four areas: cognitive function, sleep quality, nutrition and muscle endurance; these responses

## ABSTRACT

Fatigue is a common and distressing symptom that is a concern for cancer patients, their families, carers and health professionals. Cancer-related fatigue is a multidimensional phenomenon that is self-perceived and includes physical, emotional, cognitive and behavioural components. It can be unrelenting, disrupts daily life, fosters helplessness and may culminate in despair. The many causes of cancer-related fatigue stem from the disease itself, the cancer treatments and their side effects. The conclusion from a recent critical review of research evidence is that physical exercise and the treatment of underlying problems, such as anaemia or clinical depression, are effective interventions. However, a wide range of practical interventions and complementary therapies are likely to be helpful such as: acupressure and acupuncture, stress management and relaxation, energy conservation measures, anticipatory guidance and preparatory information, and attention-restoring activities. This article will provide a comprehensive review of current knowledge surrounding cancer-related fatigue and the nursing interventions that can be implemented in community practice.

## KEY WORDS

♦ Cancer-related fatigue ♦ Fatigue ♦ Exercise ♦ Nursing interventions

interact and affect the ability of a person to adapt to their declining condition. The EEF focuses on distinguishing the characteristics which define tiredness, fatigue and exhaustion for the purpose of improving the way each distinct state can be managed.

## Assessment

Although it is common for people with cancer to mention that they are tired, or that they feel 'shattered', 'wiped-out' or 'drained of energy', the assessment of fatigue is often not routine practice. It is important however to listen carefully to the client and to put their remarks into context as part of a comprehensive assessment. Treatable causes such as anaemia, infection, undernourishment, dehydration and depression need to be considered and addressed. However, since the physical, cognitive and mental dimensions of fatigue are often intertwined, superficially it may not be possible to distinguish between a low mood caused by an underlying depression or by a physical deficiency of energy. It will be necessary to probe below the surface to discover more about the person's expressed problem.

Formal assessment using a multidimensional quality of life measurement tool, such as the Functional Assessment of Cancer Therapy-Fatigue (FACT-F) (Yellen et al, 1997) or the European Organization for Research and Treatment for Cancer Quality of Life Questionnaire – Cancer (EORTC QLQ C-30) (Aaronson et al, 1993) is more likely to occur if the patient is taking part in a cancer clinical trial. There are also numerous validated fatigue-specific scales that can be used in an attempt to measure, identify, screen or track an individual's fatigue (Smets et al, 1995; Piper et al, 1998; Schwartz, 1998; Quick and Fonteyn, 2005).

In routine practice, the assessment of fatigue presents similar challenges to that of pain. Both symptoms are subjective; it will depend upon whatever the patient says it is. This goes beyond the completion of a numerical symptom scale. The nurse must be able to listen carefully to what they are being told by the patient and observe closely. The nurse should enquire: How exactly is their tiredness affecting them today? Is it upsetting for them and viewed as a problem or are they accepting their limitations?

## Legitimizing fatigue

Providing information about the underlying causes of fatigue is helpful to individuals who are trying desperately to understand why they feel so awful. It is all too common for people to be unrealistic about what they can and cannot do in an effort to cope; many will continue to push themselves harder and harder and then feel depressed, helpless and exasperated when they are unable to complete a routine task.

Therefore, it is important to present fatigue as a multi-dimensional experience associated with an array of possible causes (*Table 1*). The isolation of one specific determinant is rarely possible. Instead, there are numerous biological, physical, psychological, cognitive, behavioural

and environmental factors that may coincide and thereby challenge any assumption of one simple diagnosis and management plan.

Firstly, the cancer disease process in itself is a major cause. If a tumour is inoperable, the lesion will be drawing on the limited nutritional and energy resources within the body. Secondly, tiredness and fatigue are recognized side effects in just about every treatment. The most toxic chemotherapy regimen and less disruptive hormonal or biologically-targeted therapy will include tiredness and fatigue as a recognized side effect. Surgery is a highly demanding event and will result in a reduction of energy resources owing to:

- ◆ Prophylactic antibiotics
- ◆ Anaesthetic
- ◆ Blood loss
- ◆ Wound trauma
- ◆ Possible infection
- ◆ Worry surrounding undergoing surgery for a potentially life threatening disease.

Thirdly, there are numerous side effects of cancer and its treatment that add to the burden of fatigue – all reduce the body's resources to cope with stress and draw on energy resources. Furthermore, it is common to observe that individuals experience several different side effects and problems concurrently. There is rarely one isolated cause for fatigue. For example, someone can be in pain and be breathless, or be unable to sleep because of hormonal treatment that causes hot flushes; they might also be distressed by a lymphoedematous arm or leg.

## A review of interventions

Currently there is an increasing body of literature available on a multitude of strategies and interventions which purport to ease the burden of cancer-related fatigue. A critical review of the published research evidence was conducted systematically based on the step approach set

**Table 1: Possible causes of and contributors to cancer-related fatigue**

Primary	Secondary (due to cancer treatment)	Secondary (due to side effect of illness and treatment)
Cancer disease process caused by the tumour (high levels of cytokines) <ul style="list-style-type: none"> <li>• Energy depletion</li> <li>• Deregulation of hypothalamic-pituitary-adrenal axis</li> <li>• Altered serotonin metabolism</li> </ul>	Chemotherapy Radiotherapy Surgery Hormonal therapy Biotherapies	Pain Fever Infection Sedatives Nausea and vomiting Anaemia Lymphoedema Breathlessness Disruption of sleep (night sweats, worry, pain) Inadequate nutrition and hydration/cachexia Deconditioning of muscles Depressed mood

out by Systematic Reviews: Centre for Reviews and Dissemination's Guidance for Undertaking Reviews in Health Care (CRD, University of York, 2009).

## Aims

The aims of the review were to identify the range of interventions reported in the current literature, to evaluate the strength of evidence and present useful implications for community practitioners.

## Method

A systematic search strategy was used to focus the search and retrieval of published articles that were relevant to the primary review question: Which strategies and interventions aimed at the management of cancer-related fatigue should be promoted by community practitioners?

Relevant research literature was identified by an electronic search of electronic databases (CINAHL, Medline, Cochrane Library, Web of Science) between 1995–2010, using different combinations of the following terms: cancer, neoplasm, fatigue, cancer-related fatigue, interventions, management and treatment within the title. The identified inclusion criteria determined that the selected literature was: based on human intervention studies, published in a peer-review journal, written in the English language and applicable to a review on effective interventions. Primary sources were supplemented by articles acquired from previous searches, reference lists of key articles and previously published systematic reviews.

## Results

Four hundred and thirty six of titles were initially identified, which were reduced down to 152 publications owing to overt lack of relevance. Further reductions of abstracts and fully retrieved articles continued based on content and quality assessment criteria (Kirshbaum, 2007). This review pragmatically synthesises the data from 61 empirical studies and four recent and relevant systematic reviews (Stone, 2002; Mitchell et al, 2007; Cramp and Daniel, 2008; Radbruch et al, 2008).

The range of potentially effective approaches was varied as displayed in *Table 2*. However, strong evidence based on rigorous empirical research remains sparse. It was not possible to identify which interventions have already been delivered by primary care and community nurses; however, five broad categories were identified in terms of applicability to community practice: exercise, pharmacological approaches, adjustment strategies, complementary therapies and psycho-educational interventions.

## Recommended interventions

### Exercise

Currently, based on the substantial body of scientific evidence, moderate physical exercise (50%–90% of the estimated maximum heart rate) is deemed to be effective in reducing fatigue in breast cancer patients during and after cancer treatment (Kirshbaum, 2007). Specialist breast

care nurses have demonstrated their impact on promoting exercise as a beneficial intervention to address the varied concerns of women in their care (Kirshbaum, 2008). In addition, there is growing evidence which provides a strong indication that exercise is also highly beneficial to those who are diagnosed with other cancers (Oldervill et al, 2003; Segal et al, 2003; Stevinson et al, 2004; Cramp and Daniel, 2008). Exercise promotes the efficient use of oxygen, lowers resting heart rate and blood pressure, increases flexibility, increases strength (muscle and bone) and promotes more restful sleep. In terms of mental and emotional benefits, exercise is known to: decrease detrimental stress, increase sense of wellbeing, self-esteem, self-efficacy and sense of being in control and overall quality of life (Kirshbaum, 2005; 2007).

All forms of exercise are recommended to help decrease fatigue, but the more aerobic the activity the better e.g. walking, swimming, cycling, running, rowing. Interval training is best for physical and psychological gain which means that the exercise should be rhythmic, involve repetitive movements of large muscle groups, include a series of short, intensive periods, be at a moderate intensity (60–85% of estimated maximum heart rate), ideally done several times a week and sustained. The exercise should be progressive, i.e. increase gradually in terms of time and frequency (Watson and Mock, 2004). A daily record or exercise diary can be very useful to set realistic goals, record progress and help motivate the individual toward helping themselves to improve their fatigued state. Some important exceptions which should be pointed out to anyone taking up this approach would be:

- No lifting of heavy weights following lymph node surgery
- Recent vomiting
- Chemotherapy within previous 24 hours
- Confusion, pallor, blurred vision, fever, chest pain, dizziness, sudden shortness of breath, irregular pulse
- Current viral infections
- Pain.

**Table 2. Examples of approaches used in the management of cancer-related fatigue**

Exercise
Nutrition and hydration
Measures to promote quality sleep and rest
Pharmacological agents (stimulants, glucocorticoids)
Blood transfusions, erythropoietin (to treat anaemia)
Energy conservation measures
Attention restoring activities
Antidepressants (specifically, selective serotonin reuptake inhibitors (SSRIs))
Stress management
Anticipatory guidance and preparatory information
Acupuncture/acupressure
Relaxation
Diary writing
Massage
Aromatherapy
Yoga

## Pharmacological approaches

Several potential treatments require further research to be conducted to support their effectiveness in treating fatigue. Erythropoietin is a hormonal growth factor which is used to increase the levels of haemoglobin within the context of high dose chemotherapy; it may be given prophylactically or following treatment. There is evidence to suggest that it is most effective in increasing vigour when anaemia is severe (Djubegovic, 2005). However, for those who have mild anaemia, the effect is not known to be any better than a blood transfusion and costs considerably more.

Antidepressants particularly selective serotonin re-uptake inhibitors (SSRIs), glucocorticoids such as prednisolone and dexamethasone, psycho stimulants such as methylphenidate and the cholinesterase inhibitor donepezil (Aricept) used in the treatment of Alzheimer's Disease, may all have some effect on the perception and alleviation of cancer-related fatigue, but the extent or guidelines for administration have not been established.

## Adjustment strategies

Much can be done to promote better use of limited energy stores and help the person to turn their attention to practical self-help strategies. For example, organization and planning of pleasurable activities and necessary tasks, delegation to family members and willing helpers and setting priorities can go a long way to reduce fatigue and improve a person's general state of wellbeing (Barsevick et al, 2004). Despite the tendency for patients to sleep or doze throughout the day, it is important to mention that more sleep will not necessarily be beneficial. Instead, sleep and rest should be balanced with activity and planned as much as possible. Measures to optimize the quality of sleep at night will be the same as for that of the general population such as: encouraging a sleep routine, creating a better sleep environment (i.e. temperature, noise level), managing stress and anxiety and avoiding caffeine and other stimulants such as nicotine, particularly in the evening (National Sleep Foundation, 2010). The encouragement of a balanced diet that includes sufficient calories, protein, carbohydrates, fat, vitamins, minerals and fluid is all part of promoting optimum health to help the person adjust to the demands of cancer, treatment and after effects.

The term 'restorative activity' was developed by Kaplan (2001) and refers to activities which result in a person feeling mentally restored; following the activity they emerge invigorated, rested, at peace, clear headed and mentally able to initiate and focus on new tasks and challenges. The focus of an intervention would be to help a person identify what they enjoy doing that is stimulating; it should hold a special fascination and allow them to take pleasure and be consumed by something that is fully engaging, e.g. music, the natural environment, or lively children.

Energy can be conserved by setting short and achievable goals that provide structure and promote a sense of control in contrast to feelings of helplessness as fatigue overcomes

the person, sometimes without advanced notice; this is what can be so distressing for them and to those closest to them. Therefore, it would be advisable to encourage patients to actively manage their fatigue by coming up with their own ideas based on their current lifestyle. Examples would include: avoid reaching and keep what is needed out on a table or counter top, iron sitting down (or avoid it altogether), delegate jobs to others as much as possible, seek out the of company people you enjoy being with, and avoid those who bring your mood down.

## Complementary therapies

Most complementary therapies are considered to be valuable in the management of fatigue to a certain extent since they tend to promote overall wellbeing. Small scale studies involving yoga (DiStasio, 2008), acupuncture and acupressure (Johnston et al, 2007; Molassiotis et al, 2007), massage (Cassileth and Vickers, 2004), healing touch (Post-White, 2003) and aromatherapy, foot soak with reflexology (Stasi et al, 2003) have all demonstrated promising results. Further intervention studies with greater statistical power are required to build a larger body of evidence with more substantive conclusions.

## Psychological and educational interventions

The psychosocial approach to fatigue management begins with facilitating expression of individual experiences and includes determining the meanings that the person attributes to the symptom. A move towards encouraging patient empowerment through self-help strategies to improve ways of addressing fatigue is advisable. The health professional should be able to provide guidance and sufficient informational support to support the person's individual circumstances. Assistance with excessive stress and anxiety may require referral to specialist practitioners.

## Conclusion

Cancer-related fatigue is a common problem for people during and after cancer treatment, that may persist for many years and will worsen as the disease progresses. It is challenging to manage because of its complex, multidimensional nature. An individual, empowering and holistic approach is recommended that includes recognition and discussion of the symptoms, its probable causes and possible management approaches. Research evidence is still required to provide stronger support and credibility to a wide range of interventions. **BJCN**

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## KEY POINTS

- Cancer-related fatigue is a common symptom that affects between 80–90% of cancer patients and up to 99% of people undergoing radiotherapy or chemotherapy.
- The effects of cancer-related fatigue are multi-dimensional and can interfere with every aspect of a person's life including independence, muscle strength, concentration and social relationships and can be extremely distressing.
- As part of a comprehensive assessment it is important to listen carefully to the client's experience of fatigue and to probe information about the possible underlying cause.
- All forms of exercise are recommended to help decrease fatigue; the more aerobic the activity the better.
- It is advisable to encourage patient empowerment through self-help strategies to improve ways of addressing fatigue.