Fatigue in Patients With Cancer

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Purpose/Objectives: To provide a historic perspective on knowledge about fatigue in patients with cancer, review what is known, define gaps, and recommend future approaches.

Data Sources: Published research reports, clinical papers, review articles, and practice guidelines.

Data Synthesis: Two tested interventions show consistent positive effects: treatment of chemotherapy-induced anemia and aerobic exercise. Other frequently suggested interventions, such as adequate nutrition, energy conservation, psychostimulants, antidepressants, and increased sleep and rest, either have not been tested or studies underway are not yet complete. Current practice guidelines are based on a combination of research and expert clinical judgment.

Conclusions: The knowledge base on fatigue continues to expand. Information about the mechanisms underlying fatigue is needed to develop innovative approaches to prevent and treat fatigue.

Implications for Nursing: Current practice guidelines should be used to guide care with the expectation that guidelines will evolve to incorporate the results of studies currently underway. Although specific gaps in knowledge need to be addressed to guide future practice, clinicians need to use existing knowledge in the care they are delivering today. All of the interventions proposed for managing cancer treatment-related fatigue are health policy challenges because they represent additions to usual care rather than replacements of existing components of care.

Key Points . . .

- The Oncology Nursing Society's leadership in research and public-education activities on cancer treatment-related fatigue has had a positive impact on research and clinical practice.
- Correcting chemotherapy-induced anemia and aerobic exercise as interventions for fatigue have shown beneficial effects on energy level or fatigue across multiple studies.
- Current practice guidelines should be viewed as dynamic because recommendations will change as the results of additional studies become available and are used in place of recommendations based on best clinical judgment.
- Nurses are important advocates for the recognition and management of fatigue across cancer-care settings.

Goal for CE Enrollees

To further enhance the nurse's knowledge regarding the past, present, and future of the assessment and treatment of fatigue.

Objectives for CE Enrollees

On completion of this CE, the participant will be able to:

1. Discuss the history of cancer-related fatigue.
2. Discuss current research findings on fatigue in patients with cancer.
3. Describe implications of research findings for nursing practice.

The literature on fatigue in patients with cancer has expanded dramatically since 1980, with most of the growth concentrated from 1996–2001. Despite the increase in the number of published papers on fatigue, several important questions about this troublesome sensation remain unanswered. This article will provide a historic perspective on the generation of knowledge about fatigue in patients with cancer, review what is known, define gaps in knowledge, and recommend approaches to practice, policy, and professional education.

Background

The first research reports on fatigue in patients with cancer appeared in the late 1970s (Haylock & Hart, 1979). Interest in the topic was rekindled in the mid-1980s with the publication of Piper's conceptualization of etiologic factors for fatigue

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Digital Object Identifier: 10.1188/ONF.537-546

(Piper, Lindsey, & Dodd, 1987), chapters in oncology nursing texts, review papers, and a series of research reports that indicated that fatigue was a frequent side effect of cancer treatment (Aistars, 1987; King, Nail, Kreamer, Strohl, & Johnson, 1985; MacVicar & Winningham, 1986; McCorkle & Young, 1978; Nail & King, 1987; Piper, 1986; Rainey, 1985; Richardson, Marks, & Levine, 1988; Rieger, 1988). Possible explanations for the delay in recognizing fatigue as an issue for people with cancer include lacking an explicit fatigue indicator in toxicity ratings used in early cancer treatment trials, subsuming fatigue under the concept of nausea, and assuming that fatigue was an unavoidable part of the cancer experience. When researchers began asking subjects to generate lists of side effects and symptoms and using symptom checklists that included fatigue, it became clear that fatigue was a major problem.

As the body of research evidence about the incidence, prevalence, and impact of fatigue continued to grow, little was being done to address the problem in clinical practice. Fatigue was not part of the routine assessment paradigm, few interventions were proposed for managing fatigue, and the prevailing attitude among healthcare providers, patients, and the public was one of unquestioning acceptance of fatigue as untreatable. By the early 1990s, review papers on fatigue in patients with cancer were appearing (Irvine, Vincent, Bubela, Thompson, & Graydon, 1991; Richardson, 1995; Smets, Garssen, Schuster-Uitterhoeve, & deHaes, 1993). The first consensus conference on cancer treatment-related fatigue was held by the Oncology Nursing Society (ONS) with support from the Schering Corporation (Winningham et al., 1994). The common conclusion of these review and consensus papers is that fatigue was a high-incidence side effect of cancer treatment that was poorly understood in terms of both mechanisms and interventions.

In late 1994, Ortho Biotech, Inc., committed funds to ONS for a national campaign to promote research, professional education, and public education on fatigue in patients with cancer. This campaign, the FIRE® (Fatigue Initiative through Research and Education) Project, represented a new model for directing attention and resources to a specific clinical problem. This 1995 intensive professional education program was offered to 200 ONS members selected on a competitive basis. Three $50,000 research-planning grants were awarded in the first round of funding. One major research grant of $500,000 was available for the second round of funding. Additional research awards were made for instrumentation studies and fellowships to promote the development of researchers interested in fatigue in patients with cancer. The first public-education program was held in 1998, and the program has been carried out annually since then.

Although the original project was based in the United States, fatigue initiatives developed in Canada and Europe. Fatigue became a popular topic for local and regional workshops, appeared on the symptom management agenda in cancer care, was incorporated in resource materials provided by national cancer care groups, and now is viewed as a major clinical problem and high priority research topic. Sources of funding for research on fatigue in patients with cancer include the National Cancer Institute, National Institute of Nursing Research, Department of Defense, American Cancer Society, ONS Foundation, and other health- and cancer-oriented groups. As a result of these activities, knowledge about cancer treatment-related fatigue has grown, but critical gaps still exist in knowledge. The purpose of this article is to provide direction for practice, research, education, and policy by critically reviewing and synthesizing existing knowledge.

Defining Fatigue

Many definitions of fatigue have been proposed across several different bodies of literature. Many of them define the symptom of fatigue in terms of a person's response to it (e.g., decreased activity, negative mood), whereas others conceptualize fatigue as muscle weakness, low motivation, or lack of mental alertness or a constant energy level (Cella, 1997; Cimprich, 1992; Dalakas, Mock, & Hawkins, 1998; Gall, 1996; Glover, Dibble, Dodd, & Miaskowski, 1995; Greenberg, Sawicka, Eisenthal, & Ross, 1992; Hann et al., 1998; Hayes, 1991; Hinds et al., 1999; Jones, Wadler, & Hupart, 1998; Kalman & Villani, 1997; Mendoza et al., 1999; Monga et al., 1997; Pearce & Richardson, 1996; Piper et al., 1987; Ream & Richardson, 1996; Smets, Garssen, Bonke, & deHaes, 1995; Tiesinga, Dassen, & Halfens, 1996; Visser & Smets, 1998). Fatigue often is viewed as having multiple dimensions (Piper, 1997). For example, some studies have addressed mental fatigue, physical fatigue, and emotional fatigue as separate components. Others include activity level as a dimension of fatigue. The conceptual debate about the dimensions of fatigue will continue until a clear consensus exists regarding whether responses can and should be separated from the sensation and whether specific components or types of fatigue (e.g., mental, physical, emotional) can be defined and measured. The most commonly used definition of fatigue and the one that avoids incorporating assumptions about responses states that fatigue is a sensation of tiredness (Winningham et al., 1994). The corollary to this statement is that as a sensation, fatigue should be approached as a self-perceived state.

Despite the relative clarity and simplicity of this position, research on fatigue in patients with cancer is based on a variety of different definitions and often poses conceptual challenges. For example, studies of erythropoietin as a treatment for chemotherapy-induced anemia asked patients to rate their energy level but were interpreted as demonstrating effects on fatigue. Other studies focused on activity level based on the assumption that a clear, inverse linear relationship is present between fatigue and activity, some include muscle weakness as fatigue, and several continue to depend on an external observer rating of fatigue. In the first paper to assess the relationship between self-perceived energy and self-perceived fatigue, Schwartz et al. (2000) noted that these two sensations are related inversely but do not represent opposite ends of a continuum. Patients in this analysis reported that feelings of fatigue and energy can coexist, challenging the assumption of a continuum of fatigue and energy. Results of studies of the relationship between fatigue and physical movement in patients who are not enrolled in exercise programs are inconsistent (Berger, 1998; Berger & Farr, 1999; Sarna & Conde, 2001). These examples indicate the need for critical evaluation of the assumptions underlying research and practice.

The attribution of the cause of fatigue creates challenges in practice and research. Most studies address fatigue as a side effect of treatment for cure or local control of cancer. However, as demonstrated by Vogelzang et al. (1997) in their national survey, oncologists often view fatigue as a symptom of cancer rather than as a side effect of treatment. Although fatigue now is being included in descriptive studies of patients

with advanced cancer or those referred to palliative care services (Donnelly & Walsh, 1995; Stone et al., 1999), factors that may contribute to fatigue in this population that are different from those experienced by patients undergoing active treatment have not been studied. Also, interest is emerging in the phenomenon of persistent fatigue in patients who have completed treatment and have no evidence of disease (Andrykowski, Curran, & Lightner, 1998; Broeckel, Jacobsen, Horton, Balducci, & Lyman, 1998; Bush, Haberman, Donaldson, & Sullivan, 1995; Dean & Ferrell, 1995; Fobair et al., 1986; Greenberg et al., 1997; Haberman, Bush, Young, & Sullivan, 1993; Mast, 1998; Steginga & Dunn, 1997). Except for a trial of a psychostimulant (Sarhill et al., 2001) and a pilot study of an exercise intervention in patients with advanced cancer (Porock, Kristjanson, Tinnelly, Duke, & Blight, 2000), the published research on interventions addresses acute cancer treatment-related fatigue in patients with localized cancer. Research on interventions for fatigue in patients who have completed treatment or those with advanced disease will develop as the description of the fatigue problem in these populations matures.

Assessment

The goals of clinical assessment of fatigue and approaches to measuring fatigue in research are different. Clinical assessment must be rapid, the approach should be applicable to large populations of clients at risk for fatigue, the results of the assessment must be useful in guiding practice decisions, and clinical hypotheses about fatigue should drive decisions about targeted follow-up assessment. When fatigue is measured from a research perspective, the approach may be more time-consuming than a clinical assessment approach and the data obtained may be tailored to address the concerns of a specific study sample rather than be applicable to the general population of patients with cancer. In addition, the concepts of interest may be broader than those required for clinical assessment, and measures that maximize both variance and precision may be required in research but not in clinical assessment (Meek et al., 2000; Piper, 1997; Varricchio, 1985, 2000). In practice and research environments, the approach must yield reproducible results across evaluators and within the same patient when fatigue has not changed; the tool must be sensitive enough to detect real differences, and the approach should not be so long that it produces fatigue (Meek et al.; Nunnally & Bernstein, 1994).

Clinical Assessment

Decisions about managing fatigue are based on assessing both the level of sensation and the impact of fatigue on the patient. Researchers must take into account the time period when a patient is most likely to experience fatigue in relation to the timing of the assessment. For example, asking a person about fatigue on the day of a scheduled chemotherapy treatment will not capture the experience of fatigue in the days immediately following treatment, a time when peak fatigue often is found. Assessment tools that require complex scoring procedures or those that assign scores that do not make sense to the casual user will not perform well in clinical practice.

No published evaluations of clinical assessment approaches exist; therefore, recommendations are derived from research instrumentation studies and best clinical judgment. The sensation of fatigue is captured in numeric rating scales based on a 1–10 or 0–10 approach similar to the standard clinical assessment of pain (Piper et al., 1998). Given the importance of understanding the impact of fatigue, similar numeric rating approaches can be used to assess the levels of distress and disruption in usual activities caused by fatigue. The time frame (e.g., today, in the five days after the last treatment, over the past week) should be tailored to the treatment schedule and based on data from common patterns of fatigue with that treatment. Published guidelines for evaluating potential etiologic factors should be used to structure additional assessment once fatigue has been identified (Mock et al., 2000).

Measurement Approaches in Research

At least 18 self-report fatigue instruments have been published (e.g., Piper's review of selected instruments [Piper, 1997]). The selection of a research instrument depends on conceptual and practical considerations summarized in review papers (Piper, 1997; Varricchio, 1985, 2000). General weaknesses of the body of knowledge on research instrumentation for fatigue include the lack of head-to-head comparisons of the performance of various instruments, overlap of items between fatigue instruments and the instruments used to measure outcomes (e.g., quality of life, day-to-day function), and a focus on assessment of the stability of scores without addressing the ability of the instrument to detect clinically important differences (Meek et al., 2000). The issue of response shift bias also is problematic in interpreting the results of research. Response shift occurs as a result of adaptation to a new situation. People who are experiencing a change in sensation, such as increased fatigue, may no longer relate to the concept of being free of fatigue. They recalibrate their internal standard so that the sensation they now rate as not being tired was rated previously as being a little tired and their old reference point for being extremely tired changes to moderately tired (Breetvelt & Van Dam, 1991; Sprangers, 1996; Sprangers et al., 1999; Visser, Smets, Sprangers, & deHaes, 2000). Response shift is problematic because it decreases the magnitude of changes reported by patients as fatigue worsens and minimizes differences between people with cancer who have experienced fatigue and so-called "healthy" control subjects.

Research Needed

Evaluations of the usefulness of brief approaches to assessment in clinical practice and their relationship to management decisions urgently are needed. Further work on research instruments should focus on populations (e.g., children with cancer) who have not been included in most of the earlier studies. Direct comparisons of specific instruments over time periods when important changes in fatigue are expected are needed to determine the relative utility of the instruments in detecting these changes. More fine-grained work on the experience of fatigue with various types of treatment may be helpful in defining dimensions of fatigue that differ by type of treatment and providing guidance about the choice of multidimensional versus unidimensional measurement approaches.

Interventions

Pharmacologic Interventions

Erythropoietin: Research on the use of erythropoietin in patients with chemotherapy-induced anemia consistently shows

that improved hemoglobin levels are accompanied by improved self-reported energy levels (Glaspy, 1997; Henry & Abels, 1994) (see Table 1). All of the erythropoietin studies focus on correcting chemotherapy-induced anemia, not on preventing it; therefore, only patients with nonmyeloid malignancies who experience chemotherapy-induced anemia are included. The definition of anemia varies somewhat from study to study, but all apply a specific hemoglobin level as a cut point rather than examining the relative change in hemoglobin level within each subject. Because erythropoietin therapy was withdrawn in all studies after subjects met an established upper hemoglobin limit, the effect of bringing hemoglobin levels up to "normal" or to pretreatment levels on energy level is not known. Despite these limitations, the pattern of results across these studies is remarkably similar and provides strong support for the hypothesis that improving hemoglobin levels improves energy levels in adults receiving myelosuppressive cancer chemotherapy for nonmyeloid malignancies.

Psychostimulants: Psychostimulants, such as methylphenidate, are being tested to determine whether they improve fatigue in patients with a variety of chronic illnesses. Results of pilot studies conducted with patients with advanced cancer are promising (Homsi, Walsh, & Nelson, 2000), as are the results of a pilot study with patients receiving interferon for malignant melanoma (A.L. Schwartz, personal communication, October 10, 2000).

Antidepressants: Antidepressants are being tested to determine whether they have an effect on fatigue in patients undergoing cancer treatment based on the idea that a cancer treatment-induced neurotransmitter mechanism may contribute to fatigue. Preliminary results of a randomized trial of women with breast cancer showed that an antidepressant improved mood without improving fatigue (Morrow, Roscoe, Hickok, & Matteson, 2001). This finding is not surprising because earlier work demonstrated different patterns for fatigue and depression in a sample of patients with cancer undergoing treatment (Visser & Smets, 1998). However, the idea that fatigue is a symptom of depression is accepted widely. This is particularly problematic in nondepressed patients with fatigue who have potentially treatable physiologic problems (e.g., chemotherapy-induced anemia) or who may be candidates for nonpharmacologic interventions (e.g., exercise), but are treated with antidepressants instead. A neurotransmitter-based mechanism may be responsible for some of the fatigue experienced by patients with cancer, and it could be modified by specific antidepressants. Further research is needed to examine these complex mechanistic and practical questions.

Nonpharmacologic Interventions

Exercise: Exercise has been tested as an approach for managing fatigue in women with breast cancer receiving adjuvant treatment and in patients undergoing bone marrow or stem cell transplant (Dimeo et al., 1996; Dimeo, Stieglitz, et al., 1997; Dimeo, Stieglitz, Novelli-Fischer, Fetscher, & Keul, 1999; Dimeo, Tilmann, et al., 1997; Friedenreich & Courneya, 1996; MacVicar & Winningham, 1986; Mock et al., 1994, 1997, 2000; Pinto & Maruyama, 1999; Portenoy & Itri, 1999; Schwartz, 1999) (see Table 2). All of the studies have focused on aerobic conditioning rather than resistance exercises, and many are limited by small sample sizes and problems with fatigue instrumentation. Although they vary by type of aerobic exercise suggested, approaches to measuring fatigue, timing of exercise, and follow-up measures, the results of the studies show that exercise decreases fatigue. Specific comparisons of the effects of exercise initiated during or following chemotherapy are included in an ongoing study of patients with breast, colorectal, or prostate cancer (Dodd, 2000). The results of the present study will provide important information in program planning and implementation for supportive care services addressing fatigue.

Energy conservation: No studies of the effects of energy conservation interventions on fatigue in any chronic illness state have been published. Although energy conservation frequently is suggested as an approach to managing the fatigue that accompanies cancer treatment, it is not clearly defined or operationalized in the literature. One study is in progress that is testing a cognitive-behavioral approach to energy conservation in outpatients receiving chemotherapy or radiation for nonmetastatic cancer (Barsevick, 2000). The results of this study will contribute to the understanding of the acceptance, use, and nature of energy conservation techniques, as well as their effect on the sensation of fatigue.

Sleep and rest: Sleep and rest for people with cancer have received limited attention. Although increasing sleep and rest often are suggested as self-care strategies for use in managing cancer treatment-related fatigue, no tests have been published on these interventions. Recent studies of sleep and rest patterns in patients with cancer demonstrate significant disruption in sleep, often associated with other symptoms, and document a relationship between sleep disruption and fatigue

Table 1. The Effect of Erythropoietin on Self-Reported Energy Level

Source	Level of Evidence[a]	Description	Result
Henry & Abels, 1994	2	Double-blind randomized clinical trial and open-label follow-up	Improved hemoglobin (Hgb) accompanied by improved energy
Glaspy, 1997	3	Single group pre/post	Improved Hgb accompanied by improved energy
Demetri et al., 1998	3	Single group pre/post	Improved Hgb accompanied by improved energy
Portenoy & Itri, 1999	5	Expert opinion	Treat anemia to reduce fatigue
Mock et al., 2000	4	Consensus	Treat anemia to reduce fatigue

[a] 1—Meta-analyses or systematic review, 2—randomized clinical trial or well-designed multiple group quasi-experimental study, 3—single group study, 4—consensus which includes clinical judgment, 5—expert opinion

Table 2. The Effect of Exercise on Fatigue

Source	Level of Evidence[a]	Description	Result
MacVicar & Winningham, 1986	2	Quasi-experimental	Exercise reduces fatigue.
Mock et al., 1994	2	Randomized clinical trial	Exercise reduces fatigue.
Friedenreich & Courneya, 1996	1	Systematic review	Exercise reduces fatigue.
Dimeo et al., 1996	3	Single group pre/post	Exercise reduces fatigue.
Dimeo, Tilmann, et al., 1997	3	Single group pre/post	Exercise reduces easy fatigability.
Mock et al., 1997	2	Randomized clinical trial	Exercise reduces fatigue.
Dimeo et al., 1998	3	Single group pre/post	Exercise reduces fatigue.
Pinto & Maruyama, 1999	1	Systematic review	Exercise reduces fatigue.
Portenoy & Itri, 1999	5	Expert opinion	Exercise reduces fatigue.
Schwartz, 2000	3	Single group pre/post	Exercise reduces fatigue.
Mock et al., 2000	4	Consensus	Exercise reduces fatigue.

[a] 1—Meta-analyses or systematic review, 2—randomized clinical trial or well-designed multiple group quasi-experimental study, 3—single group study, 4—consensus which includes clinical judgment, 5—expert opinion. For an expanded explanation of levels of evidence, see Ropka and Spencer-Cisek (2001).

(Berger, 1998; Berger & Farr, 1999; Miaskowski & Lee, 1999).

Other restorative activities: Attentional fatigue, a specific deficit in the ability to direct attention, maintain mental focus, or concentrate, is the subject of a series of studies of women with breast cancer (Cimprich, 1992, 1993, 1999). Specific attention-restoring exercises that involve periodically clearing the mind and concentrating on one thing, most often an outdoor setting, were tested to determine their effects on neuropsychologic function and the sensation of fatigue (Cimprich, 2000). The links between neuropsychologic function and the general sensation of fatigue have not been established, but it is clear that cancer survivors view cognitive deficits and the effort required to compensate for them as contributors to overall feelings of fatigue.

Stress management and psychosocial support: Some studies of broad-based psychosocial interventions have reported unexpected effects on fatigue, usually when fatigue originally was measured as a component of a measure of mood (Fawzy, 1995; Fawzy et al., 1990; Spiegel, Bloom, & Yalom, 1981). In these studies, assessing the validity of the intervention in relation to effects on fatigue, the content of the intervention, and potential clinical confounds that threaten the internal validity of the study is difficult. Because the original interventions did not target fatigue, the amount and type of information about fatigue and suggestions for self-care included in the interventions were not described or controlled, and use of these suggestions by participants was not examined. In these studies, the effects on fatigue may have resulted from adopting interventions suggested by other patients during group interventions (Fawzy et al.; Spiegel et al.) or using approaches suggested by the nurse during individual counseling sessions (Fawzy), rather than an overall effect of a fairly broad psychosocial intervention.

Nutritional support and nutritional supplements: Adequate nutrition and hydration are suggested commonly to manage fatigue. The interest in nutrition as an etiologic factor of fatigue is derived from the view that the body needs adequate fuel to function. However, most studies of nutrition in people with cancer focus on muscle wasting and weight loss and have not included fatigue as a variable. In the one published study of the relationship between fatigue and nutritional status over time in patients with lung cancer receiving radiation therapy, fatigue scores and various indicators of nutritional status were not related (Beach, Siebeneck, Buderer, & Ferner, 2001). No published studies of the effects of specific vitamins, minerals, herbs, nutritional supplements, or diets relating to cancer treatment-related fatigue exist. Similarly, fatigue has not been studied in relation to level of hydration or as an outcome of improving hydration in patients with cancer.

Despite the lack of data, nutritional approaches to fatigue management are popular with the public. Feeling vigorous, clear-headed, energetic, or less tired are common marketing claims used in the nutritional supplement industry. No studies have been conducted on the patterns of use of specific nutritional supplements and dietary strategies aimed at treating fatigue among patients with cancer. Research is needed to determine the relationship between nutritional status and fatigue and to explore the effects of specific nutritional supplements or nutritional strategies on fatigue.

Conclusions

Knowledge about fatigue as an acute side effect of cancer treatment has expanded signicantly from 1980–2001 while information about persistent post-treatment fatigue and fatigue in patients with advanced cancer is beginning to be generated. Practice guidelines for cancer treatment-related fatigue now are being developed based on groups of studies on two specific interventions (i.e., correcting chemotherapy-induced anemia and exercise) and best clinical judgment. Additional information about mechanisms responsible for fatigue in patients with cancer is needed to identify new approaches to prevention and treatment.

Several important challenges to using existing knowledge require attention. First, not all cancer-care providers are aware of the current knowledge and many continue to view fatigue as a trivial problem. Education about fatigue as a side effect of cancer treatment should be included in the preparation of all cancer-care providers and as a component of continuing-education programs. To help patients and families advocate for state-of-the-art fatigue management, information about fatigue and available interventions need to be included in routine patient and family education. Second, the majority of the

studies of fatigue involve samples of women with breast cancer. Extending the work beyond this sample will establish the generalizability of approaches to management. Third, the knowledge base for some interventions that are suggested is underdeveloped. Many studies underway at this time will help address important gaps in knowledge and guide further development of clinical practice. Lastly, recognizing the health policy challenges posed by the recognition of fatigue as a side effect of cancer treatment and the development of successful interventions for managing it is important. In most cancer treatment studies, an existing treatment is accepted and assumed to be part of the health insurance benefit. The question of interest in most treatment studies is whether the new treatment is better than the standard treatment. In the case of fatigue, the problem is quite different. The challenge is to acquire the resources needed to treat fatigue when the standard of care is no treatment; therefore, the issue is adding resources rather than transferring existing resources from one treatment to another.

The growth of knowledge about fatigue in patients with cancer has been quite rapid, moving from isolated research reports in the late 1970s to the development of research-based guidelines for some interventions in the late 1990s (Mock et al., 2000; Portenoy & Itri, 1999). The generation of knowledge has been accompanied by changes in clinical practice as well. By 1994, 60% of oncology nurses responding to a research utilization survey were aware of the need for systematic assessment of fatigue in patients undergoing cancer treatment (Rutledge, Greene, Mooney, Nail, & Ropka, 1996). Since the mid-1980s, fatigue has been discussed as a side effect of cancer treatment in the major oncology nursing texts and was addressed in a supportive care textbook with a medical focus (Portenoy & Miaskowski, 1998). The ongoing challenge is to develop guidelines for interventions that are feasible for implementation in diverse clinical settings, flexible enough to respond to the generation of new knowledge, and effective in producing clinically important outcomes that influence public policy on healthcare access and reimbursement.

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