Article

Putting Evidence Into Practice: An Update of Evidence-Based Interventions for Cancer-Related Fatigue During and Following Treatment

Sandra A. Mitchell, PhD, CRNP, AOCN®, Amy J. Hoffman, MSN, PhD, RN, Jane C. Clark, PhD, RN, AOCN®, GNP-C, Regina M. DeGennaro, DNP, RN, AOCN®, CNL, Patricia Poirier, PhD, RN, AOCN®, Carolene B. Robinson, RN, MA, CNS, AOCN®, CBCN®, and Breanna L. Weisbrod, MS, APRN, AGCNS-BC, OCN®

© fuse/Thinkstock

Cancer-related fatigue (CRF) has deleterious effects on physical, social, cognitive, and vocational functioning, and causes emotional and spiritual distress for patients and their families; however, it remains under-recognized and undertreated. This article critically reviews and integrates the available empirical evidence supporting the efficacy of pharmacologic and nonpharmacologic treatment approaches to CRF, highlighting new evidence since 2007 and 2009 Putting Evidence Into Practice publications. Interventions that are recommended for practice or likely to be effective in improving fatigue outcomes include exercise; screening for treatable risk factors; management of concurrent symptoms; yoga; structured rehabilitation; Wisconsin ginseng; cognitive-behavioral therapies for insomnia, pain, and depression; mindfulness-based stress reduction; and psychoeducational interventions such as anticipatory guidance, psychosocial support, and energy conservation and activity management. This information can be applied to improve the management of CRF, inform health policy and program development, shape the design of clinical trials of new therapies for CRF, and drive basic and translational research.

Sandra A. Mitchell, PhD, CRNP, AOCN®, is a research scientist in the Division of Cancer Control and Population Sciences at the National Cancer Center in Bethesda, MD; Amy J. Hoffman, MSN, PhD, RN, is an assistant professor in the College of Nursing at Michigan State University in East Lansing; Jane C. Clark, PhD, RN, AOCN®, GNP-C, is a consultant at the Georgia Center for Oncology Research and Education in Atlanta; Regina M. DeGennaro, DNP, RN, AOCN®, CNL, is an assistant professor in the School of Nursing at the University of Virginia in Charlottesville; Patricia Poirier, PhD, RN, AOCN®, is an associate professor in the School of Nursing at the University of Maine in Orono; Carolene B. Robinson, RN, MA, CNS, AOCN®, CBCN®, is a clinical nurse specialist at UnityPoint Health Trinity in Moline, IL; and Breanna L. Weisbrod, MS, APRN, AGCNS-BC, OCN®, is a clinical nurse specialist in the Department of Nursing at the University of Kansas Hospital in Kansas City. The authors take full responsibility for the content of the article. The authors did not receive honoraria for this work. The content of this article has been reviewed by independent peer reviewers to ensure that it is balanced, objective, and free from commercial bias. No financial relationships relevant to the content of this article have been disclosed by the authors, planners, independent peer reviewers, or editorial staff. Mitchell can be reached at mitchlls@mail.nih.gov, with copy to editor at CJONEditor@ons.org. (Submitted July 2014. Accepted for publication August 2, 2014.)

Key words: cancer-related fatigue; cancer; management; nursing; evidence-based practice

Digital Object Identifier: 10.1188/14.CJON.S3.38-58

The National Comprehensive Cancer Network ([NCCN], 2014) defined cancer-related fatigue (CRF) as an unusual, persistent, and subjective sense of tiredness that is not proportional to recent activity and interferes with usual functioning. The clinical expression of CRF may include generalized weakness, diminished mental concentration, insomnia or hypersomnia, and emotional reactivity (de Raaf, de Klerk, & van der Rijt, 2013; Goedendorp, Gielissen, Verhagen, & Bleijenberg, 2009). Depending on how fatigue is defined and measured, prevalence estimates across the cancer continuum range from 25%–99% (Campos, Hassan, Riechelmann, & Del Giglio, 2011; Dhruva et al., 2013; Humpel & Iverson, 2010; Langston, Armes, Levy, Tidey, & Ream, 2013; Neefjes, van der Vorst, Blauwhoff-Buskermolen, & Verheul, 2013; Peters, Goedendorp, Verhagen, van der Graaf, & Bleijenberg, 2013; Van Lancker et al., 2014; Weis, 2011). Building on the framework of previously published Putting Evidence Into Practice summaries (Mitchell & Beck, 2009; Mitchell, Beck, Hood, Moore, & Tanner, 2007), this article critically appraises the strength and quality of the evidence regarding the safety and efficacy of pharmacologic and nonpharmacologic interventions to ameliorate CRF during and following cancer and its treatment, and at the end of life. Although the recommendations provided represent the best available evidence, clinical judgment and individual circumstances should determine appropriate interventions for specific patients.

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

Methods

Computerized searches of PubMed and CINAHL® were performed using the search terms listed in Figure 1. Database searches were performed by a medical librarian in consultation with study team members. Citations published from January 1990 through March 2014 were retrieved, and articles meeting the inclusion criteria listed in Figure 2 were summarized and critically appraised by a team of RNs, advanced practice nurses, and nurse scientists. Tables of evidence were prepared, and major and minor study design flaws were identified using the taxonomy proposed by Hadorn, Baker, Hodges, and Hicks (1996). After the evidence supporting each intervention had been critically examined, the collective weight of the evidence for each identified intervention was classified using evidence quality, magnitude of the outcome (effect size), safety, and concurrence of the evidence among studies. The Oncology Nursing Society's weight-of-evidence categories were adapted by Mitchell and Friese (2009) from other published schema (Atkins et al., 2004; Lohr, 2004).

Results

Figure 3 lists the fatigue interventions for which evidence exists from one or more empirical studies, classifying them based on the collective strength of the evidence about their efficacy and safety. Several interventions for fatigue identified in the literature were supported by expert opinion only (NCCN, 2014).

Recommended for Practice

Exercise/physical activity has been confirmed as effective in the management of CRF in more than 40 meta-analyses or systematic reviews of randomized, controlled trials (RCTs); more than 20 of the reviews have been published since 2010 (Braam et al., 2013; Brown et al., 2011; Cramer, Lauche, Klose, Dobos, & Langhorst, 2014; Cramp & Byron-Daniel, 2012; Crandall, Maguire, Campbell, & Kearney, 2014; Eickmeyer, Gamble, Shahpar, & Do, 2012; Focht et al., 2013; Fong et al., 2012; Keogh & MacLeod, 2012; McMillan & Newhouse, 2011; Mishra, Scherer, Geigle, et al., 2012; Mishra, Scherer, Snyder, et al., 2012; Mustian, Sprod, Janelsins, Peppone, & Mohile, 2012; Paramanandam & Dunn, 2014; Payne, Wiffen, & Martin, 2012; Persoon et al., 2013; Puetz & Herring, 2012; Speck, Courneya, Mâsse, Duval, & Schmitz, 2010; Strasser, Steindorf, Wiskemann, & Ulrich, 2013; Tomlinson, Diorio, Beyene, & Sung, 2014; van Haren et al., 2013; Velthuis, Agasi-Idenburg, Aufdemkampe, & Wittink, 2010; Wolin, Ruiz, Tuchman, & Lucia, 2010; Zou, Yang, He, Sun, & Xu, 2014). Populations in which effectiveness has been demonstrated include patients with breast, colon, and prostate cancers; patients undergoing treatment with radiation, chemotherapy, or hematopoietic stem cell transplantation; young adults with cancer; and survivors who have been treated for a solid tumor or a hematologic malignancy. In their meta-analysis, Puetz and Herring (2012) noted that exercise exerts a palliative effect on fatigue during active treatment and provides a rehabilitative effect following treatment. Limitations of the current evidence base remain that effect sizes are generally small, and positive results for the outcome of CRF have not been observed consistently across studies (Cramp & Byron-Daniel, 2012; Eickmeyer et al., 2012; Mustian et al., 2012). The exercise modalities that have been examined differ in content (walking, cycling, swimming, resistive exercise, or combined exercise), as well as frequency, duration, intensity, and degree of supervision (i.e., fully supervised groups versus self-directed exercise). Knowledge about the type, intensity, and duration of physical exercise most beneficial in reducing fatigue at different stages of disease and treatment is still emerging (Puetz & Herring, 2012), and more research is needed to systematically assess the safety, tolerability, and efficacy of aerobic exercise and strength training in cancer subpopulations, such as those with lung cancer (Brown et al., 2011; Paramanandam & Dunn, 2014), and across the cancer-control continuum (Wolin, Schwartz, Matthews, Courneya, & Schmitz, 2012).

Likely to Be Effective

Psychoeducational interventions, including those delivered via the Internet, have been tested in more than a dozen RCTs or quasiexperimental studies and continue to demonstrate positive effects on fatigue outcomes (Allison et al., 2004; Badger et al., 2011; Björneklett et al., 2012; Boesen et al., 2005; Brown et al., 2006; Chan, Richardson, & Richardson, 2011; Dolbeault et al., 2009; Donnelly et al., 2011; Fawzy et al., 1990; Fillion et al., 2008; Given et al., 2002; Godino, Jodar, Durán, Martinez, & Schiaffino, 2006; Goedendorp et al., 2010; Johnston et al., 2011; Kim, Roscoe, & Morrow, 2002; Mollaolu & Erdoan, 2014; Ream, Richardson, & Alexander-Dann, 2006; Reif, de Vries, Petermann, & Görres, 2013; Schjolberg et al., 2014; Vilela et al., 2006; Wangnum et al., 2013; Yates et al., 2005; Yesilbalkan, Karadakovan, & Göker, 2009; Yun et al., 2012). In addition, several systematic reviews have concluded that psychoeducational interventions are efficacious for CRF management (Duijts, Faber, Oldenburg, van Beurden, & Aaronson, 2011; Fors et al., 2011; Goedendorp et al., 2009; Jacobsen, Donovan,

Computerized database searches were performed using the following terms, with and without the additional search terms *cancer*, *neoplasms*, *fatigue*, and *cancer-fatigue*. In some instances, search terms were exploded so that all of their more narrow terms were simultaneously searched.

- Fatigue due to drug therapy
- Anemia
- Exercise movement techniques
- Exercise
- Exercise therapy
- Aerobic exercise
- Erythropoietin
- Psychoeducation(al)
- Education
- Psychotherapy
- Sleep
- Rehabilitation
- Complementary and alternative medicine
- Acupuncture
- Yoga
- Massage
- Aromatherapy
- Music therapy
- Healing touch
- Meditation
- Nutrition(al)
- Nutritional status
- Diet
- Vitamins
- Nutrition(al) supplements
- Drugs names (paroxetine, methylphenidate, modafinil, bupropion, testosterone, corticosteroids)
- Drug therapy
- Psychostimulants
- Antidepressants

FIGURE 1. Literature Search Terms

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

English-language published reports of quantitative studies, systematic reviews, or meta-analyses related to cancer-related fatigue interventions that met all of the following criteria were selected for review.

1. Article was a full report (not an abstract) of an empirical study of a pharmacologic or nonpharmacologic intervention administered explicitly to manage or treat fatigue.
2. Fatigue was (a) measured using either an instrument designed explicitly to measure the construct of fatigue or measured using a fatigue subscale of a quality of life or other instrument, and (b) the scores on the fatigue measure or the fatigue subscale were reported in the results.
3. Fatigue reduction, either as an isolated outcome or as a component of a symptom cluster, was the intended purpose of the intervention.
4. Fatigue was identified explicitly as a primary, secondary, or exploratory endpoint, and the rationale for the intervention was reduction of symptoms, not treatment of the underlying malignancy.
5. Study participants were adult patients with cancer who were anywhere in the postdiagnosis trajectory, including during active treatment (i.e., surgery, chemotherapy, biotherapy, molecularly targeted therapy, or hematopoietic stem cell transplantation), post-treatment follow-up, survivorship, or at the end of life.

Note. For intervention categories in which a meta-analysis was available, only those papers not included in the meta-analysis were selected for review.

FIGURE 2. Inclusion Criteria

Vadaparampil, & Small, 2007; Kangas, Bovbjerg, & Montgomery, 2008; Larkin, Lopez, & Aromataris, 2013). At the same time, some trials of psychoeducational interventions failed to demonstrate an effect on CRF; however, the interventions favorably affected other outcomes that may relate to CRF, including psychological symptoms, activity levels, or sleep quality (Armes, Chalder, Addington-Hall, Richardson, & Hotopf, 2007; Goodwin et al., 2001; Purcell, Fleming, Burmeister, Bennett, & Haines, 2011). Psychoeducational interventions typically incorporate anticipatory guidance about patterns of fatigue and tailored recommendations for self-management of fatigue, including increased activity, exercise, measures to address sleep dysregulation, coaching and emotional support to enhance motivation, self-care and active coping, and praise and encouragement to promote self-efficacy and goal-setting and augment feelings of control. Many of the effective psychoeducational interventions also included components of *energy conservation* and *activity management*. Although energy conservation and activity management delivered as a single intervention had beneficial effects on fatigue outcomes in one RCT (Barsevick et al., 2004), a second RCT by the same investigators did not confirm a benefit for fatigue (Barsevick et al., 2010). The investigators speculated that statistical power and effect size were diminished by floor effects and low intervention potency.

Progressive muscle relaxation and/or relaxation breathing with or without imagery or distraction delivered in a series of sessions has been shown in six small RCTs to improve CRF in outpatients undergoing radiotherapy (Decker, Cline-Elsen, & Gallagher, 1992), allogeneic hematopoietic stem cell transplantation recipients (Kim & Kim, 2005), women with early-stage breast cancer (Cohen & Fried, 2007), patients who undergo breast cancer surgery (Garssen et al., 2013), women receiving adjuvant chemotherapy for breast cancer (Demiralp, Oflaz, & Komurcu, 2010), and patients with solid tumors who have pain, sleep disturbance, and fatigue (Kwekkeboom et al., 2012). Although relaxation techniques are often combined when delivered in clinical practice, isolating the effects of these intervention components complicates the interpretation of trial results. Two randomized trials comparing the effects of relaxation versus progressive resistance training on CRF outcomes are in progress (Potthoff et al., 2013; Schmidt et al., 2013).

Four RCTs and a recent systematic review provide continued evidence that *cognitive-behavioral interventions for sleep* delivered individually, in a group setting, or via the Internet also produce beneficial effects on CRF outcomes (Dirksen & Epstein, 2008; Espie et al., 2008; Fleming, Randell, Harvey, & Espie, 2014; Garland et al., 2014; Ritterband et al., 2012). The interventions include relaxation training along with sleep-consolidation strategies (i.e., avoiding long or late afternoon naps, limiting time in bed to actual sleep time), stimulus control therapy (i.e., going to bed only when sleepy, using the bed or bedroom for sleep and sexual activities only, consistently going to bed and getting up at the same time, and avoiding caffeine and stimulating activity in the evening), and strategies to reduce cognitive-emotional arousal (i.e., setting aside at least an hour to relax before going to bed and establishing a pre-sleep routine to be used every night). To date, the effect on fatigue outcomes of pharmacologic therapies designed to treat insomnia have had very little systematic study (Zee & Ancoli-Israel, 2009).

Since the last evidence update was published (Mitchell & Beck, 2009), several additional interventions, including yoga, structured multidimensional rehabilitation, and Wisconsin ginseng, are now supported by sufficiently robust evidence to conclude that they are likely to be effective for CRF.

Yoga practices significantly improved fatigue outcomes in two RCTs in breast cancer survivors (Bower, Garet, & Sternlieb, 2011; Kiecolt-Glaser et al., 2014) and women undergoing breast cancer radiation therapy (Chandwani et al., 2014). Evidence from other small trials suggests that yoga may have beneficial effects in reducing fatigue in other populations (Bower et al., 2011; Carson, Carson, Porter, Keefe, & Seewaldt, 2009; Carson et al., 2007; Cohen, Warneke, Fouladi, Rodriguez, & Chaoul-Reich, 2004; Dhruva et al., 2012; Moadel et al., 2007). However, five systematic reviews concluded that the effectiveness of yoga on fatigue outcomes has not been consistently established across a wide range of cancer populations or at all points in the cancer continuum (Buffart et al., 2012; Felbel, Meerpohl, Monsef, Engert, & Skoetz, 2014; Harder, Parlour, & Jenkins, 2012; Sadja & Mills, 2013; Zhang, Yang, Tian, & Wang, 2012). In addition, they noted a high risk of bias across studies with respect to sampling, inconsistent methods, short duration of follow-up, and non-blinding of participants and outcome assessors.

Structured multidimensional rehabilitation interventions have been evaluated in several single-arm, quasiexperimental, or preference trials (Bertheussen et al., 2012; Chasen & Bhargava, 2010; Chasen, Feldstain, Gravelle, Macdonald, & Pereira, 2013; Cuesta-Vargas, Buchan, & Arroyo-Morales, 2014; Gagnon et al., 2013; Hanssens et al., 2011; Kröz et al., 2013; Kummer, Catuogno, Perseus, Bloch, & Baumann, 2013; Lee, Lim, Yoo, & Kim, 2011; Lindemalm, Strang, & Lekander, 2005; Rabin, Pinto, Dunsiger, Nash, & Trask, 2009; Riesenberg &

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

Lübbe, 2010; Strauss-Blasche, Gnad, Ekmekcioglu, Hladschik, & Marktl, 2005; Swenson et al., 2014; van Weert et al., 2006; Windsor, Potter, McAdam, & McCowan, 2009). In addition, 11 RCTs examined these interventions in patients with a range of solid tumors, including those with advanced disease (Adamsen et al., 2006, 2009; Andersen et al., 2013; Cantarero-Villanueva et al., 2012; Cheville et al., 2010; Heim, Malsburg, & Niklas, 2007; Jensen et al., 2014; Korstjens, Mesters, van der Peet, Gijsen, & van den Borne, 2006; Li et al., 2013; van Weert et al., 2010; Wangnum et al., 2013). The interventions studied a structured combination of several components, including physical training, psychoeducation, and approaches such as nutritional counseling, mud packs, massage, relaxation, and manual lymph drainage. In some studies, the therapies were delivered over the course of several weeks during an inpatient hospital stay. Across trials, the multicomponent interventions consistently demonstrated beneficial effects on fatigue outcomes as well as other patient-centered outcomes, including physical function, mood, and nutritional status (Egan et al., 2013; Scott et al., 2013). At the same time, several trials of multicomponent rehabilitative interventions did not improve fatigue outcomes (Cheville et al., 2010; Culos-Reed et al., 2010; Gagnon et al., 2013; Gjerset et al., 2011; Hawkes et al., 2013; Pinto, Papandonatos, Goldstein, Marcus, & Farrell, 2013; Windsor et al., 2009). Interpretation of the studies is complicated by high rates of attrition, low statistical power, design flaws, and measurement of outcomes, such as vigor, other than fatigue. Group psychotherapy combined with exercise and a multimodal mind-body program combined with exercise have also been shown to improve fatigue in patients with solid tumors undergoing active treatment and during long-term follow-up (Courneya et al., 2003; Spahn et al., 2013), and a meta-analysis concluded that exercise in combination with behavioral or psychosocial interventions improves fatigue in patients with and survivors of breast cancer (Duijts et al., 2011). Disentangling the effects of intervention components and accounting for the effects of individual tailoring of many of the rehabilitation interventions makes unbiased interpretation of trial results challenging.

Wisconsin ginseng (an eight-week course of 2,000 mg daily) was effective in improving fatigue outcomes in cancer survivors and was well tolerated in a large double-blind, placebo-controlled trial (Barton et al., 2013).

Meditation, mindfulness-based stress reduction (MBSR), and *cognitive-behavioral stress management* have been shown to improve fatigue severity and fatigue-related daytime interference in five RCTs during and following treatment for breast cancer (Hoffman et al., 2012; Kim, Kim, Ahn, Seo, & Kim, 2013; Lengacher et al., 2009, 2012; Vargas et al., 2013) and in two RCTs and a single-arm trial of patients with mixed tumor sites (Carlson & Garland, 2005; Speca, Carlson, Goodey, & Angen, 2000; van der Lee & Garssen, 2012). Secondary analyses suggest that the improvement in fatigue outcomes in those receiving the MBSR intervention may be greatest in those with fatigue-related biomarker abnormalities at study baseline (Reich et al., 2014). However, two RCTs (Milbury et al., 2013; Rissanen, Arving, Ahlgren, & Nordin, 2014) and two single-arm trials in patients with mixed solid tumors (Carlson, Speca, Patel, & Goodey, 2003; Kieviet-Stijnen, Visser, Garssen, & Hudig, 2008) showed inconsistent effects on fatigue outcomes. The absence

Effectiveness Established
- Exercise

Likely to Be Effective
- Psychoeducational interventions
- Progressive muscle relaxation and/or relaxation breathing with or without imagery or distraction
- Cognitive-behavioral therapy for sleep
- Yoga
- Structured multidimensional rehabilitation
- Wisconsin ginseng
- Meditation, mindfulness-based stress reduction, and cognitive-behavioral stress management
- Management of concurrent symptoms
- Cognitive-behavioral therapy for fatigue, depression, and pain with or without hypnosis

Benefits Balanced With Harms
- Erythropoiesis-stimulating agents
- Dexamethasone

Effectiveness Not Established
- Paroxetine, sertraline, venlafaxine, donepezil, buproprion sustained release, methylphenidate, modafinil, etanercept, infliximab
- Acupuncture, acupressure, self-acupuncture
- Nutritional supplements and herbal remedies: levocarnitine, lectin-standardized mistletoe, megestrol acetate, omega-3 fatty acid supplementation, PG2 (a partially purified extract of *Astragalus membranaceus*), protein supplementation, gauran, Chinese medicinal herbs, essiac, valerian mistletoe extract
- Morning exposure to bright light
- Qigong, tai chi
- Massage, biofield therapies (Reiki, therapeutic touch, haptotherapy, polarity therapy)
- Expressive writing, art, music, dance, or animal-assisted therapy, exposure to nature, distraction (virtual reality immersion)
- Combination therapy: high-dose vitamin C, multiple vitamin, omega-3 fatty acid supplementation
- Combination therapy: aromatherapy, foot soak, and reflexology
- Combination therapy: medroxyprogesterone, celecoxib, and enteral supplementation

Supported by Expert Opinion
- Work with patient and family to improve assessment of fatigue and identify management strategies.
- Promote open communication between patient, family, and caregiving team to facilitate discussions about the experience of fatigue and its effects on daily life.
- Screen for the presence of treatable etiologic or contributing factors, including hypothyroidism, hypogonadism, adrenal insufficiency, cardiomyopathy, pulmonary dysfunction, concurrent distressing symptoms (pain, nausea, depression), emotional distress, sleep disturbances, anemia, nutritional compromise, fluid and electrolyte imbalances, and inactivity/physical deconditioning.
- Current medications (including over-the-counter medications and herbal supplements) should be reviewed to identify any agents or medications interactions that may contribute to worsening fatigue (e.g., opiates, antidepressants, antiemetics, antihistamines).
- Consider attention-restoring activities, such as exposure to natural environments and pleasant distractions (e.g., music).
- Encourage a balanced diet with adequate intake of fluid, calories, protein, carbohydrates, fat, vitamins, and minerals.

FIGURE 3. Evidence-Based Interventions for Fatigue During and Following Cancer

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

of a comparison group in the single-arm studies and the inclusion of heterogeneous meditative techniques confound the interpretation of the studies.

Management of concurrent symptoms, including pain, shortness of breath, insomnia, and depression, improved fatigue outcomes in an RCT of an advanced practice nurse intervention that incorporated systematic symptom monitoring and management (de Raaf, de Klerk, Timman, et al., 2013). A palliative care clinic consultation to address concurrent symptoms also improved CRF outcomes in a single-arm cohort study (Yennurajalingam et al., 2010).

Cognitive-behavioral therapy interventions for fatigue, depression, and pain, and cognitive-behavioral therapy combined with hypnosis have demonstrated favorable effects on fatigue outcomes. Six RCTs confirmed that cognitive-behavioral therapy interventions alleviate CRF among patients with cancer and a major depressive disorder (Strong et al., 2008), survivors with fatigue (Gielissen, Wiborg, Verhagen, Knoop, & Bleijenberg, 2012), patients with mixed tumor types undergoing cancer treatment (Goedendorp et al., 2010), severely fatigued survivors with mixed tumor types (Gielissen, Verhagen, Witjes, & Bleijenberg, 2006), severely fatigued survivors with mixed tumor types (Prinsen et al., 2013), and women with metastatic breast cancer who were depressed (Savard et al., 2006). In addition, cognitive-behavioral therapy interventions were found to alleviate CRF in a single-arm trial among depressed cancer survivors (Brothers, Yang, Strunk, & Andersen, 2011) and a systematic review (Kwekkeboom, Cherwin, Lee, & Wanta, 2010). Two RCTs of cognitive-behavioral therapy plus hypnosis in women with breast cancer showed a reduction in fatigue severity during and sustained improvements following radiation therapy treatment (Montgomery et al., 2009, 2014). Hypnosis alone was found to improve fatigue outcomes in women undergoing excisional breast biopsy or lumpectomy in an RCT with an attentional control (Montgomery et al., 2007). A systematic review concluded that cognitive-behavioral therapy plus hypnosis and hypnosis alone are supported by sparse but promising evidence of efficacy (Cramer, Lauche, Paul, et al., 2014). However, in one RCT of cognitive-behavioral therapy tailored to symptom profiles, statistically significant differences in fatigue were not seen, but the intervention improved pain outcomes (Dalton, Keefe, Carlson, & Youngblood, 2004).

Benefits Balanced With Harms

The use of *erythropoiesis-stimulating agents (ESAs)* to correct anemia may increase vigor and reduce CRF (Bohlius, Tonia, & Schwarzer, 2011; Eton & Cella, 2011; Tonia & Bohlius, 2011). However, little evidence exists that ESAs improve fatigue when anemia is less severe (Bohlius et al., 2014; Grant et al., 2013). A target hemoglobin level of 11–12 g/dl was associated with the greatest reduction in CRF and improvement in other quality-of-life outcomes (Eton & Cella, 2011). Although ESAs are generally well tolerated, the use of these agents specifically for the management of fatigue must be considered in light of safety issues, including an elevated risk for thromboembolic complications and decreased survival, particularly when ESAs are used in patients with cancer who are not receiving chemotherapy (Bohlius et al., 2011; Bormanis et al., 2013; Boulaamane et al., 2013; Gao, Ma, & Lu, 2013; Tonia et al., 2012; Tonia, Schwarzer, & Bohlius, 2013; Wauters & Vansteenkiste, 2012). National clinical practice guidelines (Lichtin, 2011; NCCN, 2015; Rizzo et al., 2010) and the recommendations of the U.S. Food and Drug Administration (2013) should guide decisions about treatment initiation, discontinuation, monitoring, and management in patients receiving ESAs.

Low-dose dexamethasone (4 mg BID for two weeks) improved CRF in patients with advanced cancer in a small randomized placebo-controlled trial (Yennurajalingam et al., 2013). Although adverse events were comparable in the dexamethasone and placebo groups, the limited follow-up and study attrition make drawing definitive conclusions difficult about the safety of dexamethasone treatment (Franco, William, Poon, & Azad, 2014; Yamane, Ochi, Yamagishi, & Takigawa, 2014; Yennurajalingam & Bruera, 2014). Systemic corticosteroids may have prominent adverse effects in particular subpopulations such as those at the end of life (Matsuo & Yomiya, 2013).

Effectiveness Not Established

More than 15 pharmacologic agents and nutritional supplements have been tested, either alone or as part of a combination therapy, for their effectiveness in improving CRF outcomes. Several systematic reviews summarized the results of trials evaluating pharmacologic agents for CRF management (Breitbart & Alici, 2008, 2010; Breitbart & Alici-Evcimen, 2007; Gong et al., 2014; Minton, Richardson, Sharpe, Hotopf, & Stone, 2008, 2010, 2011; Peuckmann, Elsner, Krumm, Trottenberg, & Radbruch, 2010).

Paroxetine may exert beneficial effects on fatigue in women with hot flashes (Weitzner, Moncello, Jacobsen, & Minton, 2002) and patients receiving interferon (Capuron et al., 2002); however, two large randomized, double-blind placebo-controlled trials failed to demonstrate an effect of paroxetine on fatigue outcomes (Morrow et al., 2003; Roscoe, Morrow, et al., 2005). Little evidence exists that the antidepressants bupropion (Cullum, Wojciechowski, Pelletier, & Simpson, 2004; Moss, Simpson, Pelletier, & Forsyth, 2006), sertraline (Stockler et al., 2007), or venlafaxine are effective in treating CRF, but treatment with venlafaxine did improve fatigue in the subgroup of participants who also experienced a significant reduction in the severity and interference caused by hot flashes (Carpenter et al., 2007).

Modafinil is a novel psychostimulant that, in single or divided daily doses of 100–400 mg, seems to be well tolerated and has shown some evidence of efficacy in improving CRF in open-label trials (Blackhall, Petroni, Shu, Baum, & Farace, 2009; Spathis et al., 2009) and in one placebo-controlled trial (Jean-Pierre et al., 2010). However, in three RCTs, the effects of modafinil on fatigue endpoints did not exceed those of the placebo (Boele et al., 2013; Hovey et al., 2014; Spathis et al., 2014).

Methylphenidate, or the *D-isomer form of methylphenidate*, administered using varying doses and schedules, reduced CRF in several trials (Kerr et al., 2012; Lower et al., 2009; Roth et al., 2010), but other studies have not confirmed this benefit (Bruera et al., 2006, 2013; Escalante et al., 2014; Moraska et al., 2010). Despite the conclusions of a number of systematic reviews that preliminary evidence supports the use of psychostimulants to

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

treat CRF (Breitbart & Alici, 2010; Gong et al., 2014; Minton et al., 2011; Portela, Rubiales, & Centeno, 2011), given mixed evidence for efficacy and the potential for side effects that may include dry mouth, hypertension, anorexia, and anxiety, the use of psychostimulants to treat CRF outside the context of a clinical trial has been discouraged until stronger evidence of efficacy is available (Barton, 2014; Ruddy, Barton, & Loprinzi, 2014).

Donepezil, a reversible acetylcholinesterase inhibitor, exhibited a positive effect on CRF in two open-label trials when given at a dose of 5–10 mg per day (Bruera et al., 2003; Shaw et al., 2006); however, a subsequent randomized, double-blinded, placebo-controlled trial did not demonstrate an improvement in fatigue outcomes over placebo (Bruera et al., 2007).

Similarly, a blinded, placebo-controlled trial of *testosterone replacement* in a small sample of men with advanced cancer did not improve fatigue endpoints (Del Fabbro et al., 2013).

Additional studies are needed to confirm the observation that *thyrotropin-releasing hormone* improved fatigue outcomes in a small, pilot, randomized, placebo-controlled crossover study in eight patients with cancer who also had significant fatigue (Kamath, Feinn, & Winokur, 2012).

Two small single-arm pilot studies have examined the effects on fatigue of targeted *anticytokine therapy* with infliximab or etanercept (Monk et al., 2006; Tookman, Jones, DeWitte, & Lodge, 2008). Small sample sizes and the lack of randomization or a control arm limit conclusions.

Acupuncture, acupressure, and self-acupuncture have been examined in several RCTs, and six meta-analyses or systematic reviews examining the evidence have been published (Chien, Liu, & Hsu, 2013; Finnegan-John, Molassiotis, Richardson, & Ream, 2013; Garcia et al., 2013; He, Wang, & Li, 2013; Johnston et al., 2011; Molassiotis et al., 2012, 2013; O'Regan & Filshie, 2010; Posadzki et al., 2013; Smith, Carmady, Thornton, Perz, & Ussher, 2013; Towler, Molassiotis, & Brearley, 2013; Zeng, Luo, Xie, Huang, & Cheng, 2014). A number of the RCTs showed a positive effect on CRF outcomes, and the evidence suggests that acupuncture, acupressure, and self-acupuncture are feasible, well accepted, and safe. However, interpretation of the study outcomes is complicated because many of the trials have high risk of bias resulting from design flaws such as short duration of follow-up, single acupuncturists, and nonblinding of outcome assessors. Although the authors of the reviews and meta-analyses captured different studies in their analyses, used different review methodologies, and have drawn somewhat conflicting conclusions (Azad & John, 2013; Ernst & Posadzki, 2013; Molassiotis, 2013a, 2013b; Molassiotis & Richardson, 2013), all have urged additional study using rigorous trial designs.

Nutritional supplements and herbal remedies that have been evaluated for their effects on fatigue outcomes as single interventions or as part of a multicomponent regimen include vitamin supplements (de Souza Fede et al., 2007; Yeom, Jung, & Song, 2007), multicomponent nutritional supplementation (Baldwin & Weekes, 2012; Macciò et al., 2012; Mantovani et al., 2006), coenzyme Q10 (Lesser et al., 2013), levocarnitine (Cruciani et al., 2004, 2006, 2009, 2012; Gramignano et al., 2006; Graziano et al., 2002; Mantovani et al., 2008), lectin-standardized mistletoe (Schumacher et al., 2003), megestrol acetate alone or in combination with omega-3 fatty acid supplementation (Bruera et al., 1998; Mantovani, 2010), PG2 (Chen et al., 2012), protein supplementation in combination with nutritional counseling (Jensen & Hessov, 1997), gaurana (da Costa Miranda et al., 2009; del Giglio et al., 2013; de Oliveira Campos et al., 2011), Chinese herbal medicine (Su, Wang, Grant, & Liu, 2014), essiac (Zick et al., 2006), and valerian (Barton et al., 2011). Improvements in fatigue endpoints were inconsistent, and results must be interpreted with caution because of the potential for bias given the preponderance of open-label, nonrandomized study designs; small samples; and testing of multiple secondary endpoints.

Morning exposure to bright light has been shown in a small RCT to prevent deterioration in CRF during chemotherapy for breast cancer (Ancoli-Israel et al., 2012), potentially by protecting recipients from circadian rhythm desynchronization during cancer treatment (Neikrug et al., 2012). A secondary analysis confirmed that improvements in quality of life also seen in response to bright light therapy were mediated by its effects on fatigue (Jeste et al., 2013). Similar findings have also been noted in a small RCT of light therapy in cancer survivors with mixed diagnoses (Redd et al., 2014).

Qigong has shown beneficial effects on fatigue outcomes in three randomized clinical trials (Campo et al., 2014; Chen et al., 2013; Oh et al., 2010), and *tai chi* improved fatigue in a small single-arm trial (Galantino, Callens, Cardena, Piela, & Mao, 2013); however a meta-analysis by Zeng et al. (2014) concluded that study results should be interpreted cautiously because of heterogeneous study quality and risk of bias.

Massage and biofield therapies such Reiki, healing touch, polarity therapy, or haptotherapy showed mixed evidence of fatigue reduction in RCTs or quasiexperimental studies (Aghabati, Mohammadi, & Pour Esmaiel, 2010; Ahles et al., 1999; Currin & Meister, 2008; Fernández-Lao et al., 2012; FitzHenry et al., 2014; Karagozoglu & Kahve, 2013; Khiewkhern, Promthet, Sukprasert, Eunhpinitpong, & Bradshaw, 2013; Lutgendorf et al., 2010; Mehling et al., 2012; Mustian et al., 2011; Post-White et al., 2003; Roscoe, Matteson, Mustian, Padmanaban, & Morrow, 2005; Tsang, Carlson, & Olson, 2007; van den Berg, Visser, Schoolmeesters, Edelman, & van den Borne, 2006). The modalities have been examined as single interventions and as part of a multicomponent intervention, combined with aromatherapy or core muscle exercises. However, methodologic limitations, including short length of follow-up, small sample sizes, and the absence of sham or active control conditions, and the mixed efficacy results, permit only tentative conclusions. Several systematic reviews have concluded that, although preliminary evidence supports the efficacy of massage and biofield therapies (Ernst, 2009; Jain & Mills, 2010; Myers, Walton, Bratsman, Wilson, & Small, 2008; Pan, Yang, Wang, Zhang, & Liang, 2013), continued testing and refinement in methodologically rigorous trials are needed (Hammerschlag et al., 2012; Visser et al., 2011).

Preliminary evidence suggests that the following *complementary approaches* may be promising in the treatment of CRF: expressive writing (de Moor et al., 2002; Lu, Zheng, Young, Kagawa-Singer, & Loh, 2012; Milbury et al., 2014; Mosher et al., 2012); biofeedback (Alvarez, Meyer, Granoff, & Lundy, 2013); cranial stimulation (Lyon, Schubert, & Taylor, 2010); art, music, dance, or animal-assisted therapy (Archer, Buxton, & Sheffield, 2014; Bar-Sela, Atid, Danos, Gabay, & Epelbaum, 2007; Bozcuk et al., 2006; Bradt, Dileo, Grocke, & Magill, 2011; Clark et al., 2006; Johnson, Meadows, Haubner, & Sevedge, 2008; Sturm, Baak,

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

Patient Education: Fatigue

Fatigue is a common problem for patients during and often for many months following cancer treatment. It is one of the most common side effects of treatment and can be difficult to describe to others. The symptoms of fatigue are different than "feeling tired." Fatigue can begin suddenly, it can be all-consuming, naps may not help, and fatigue can be physically and emotionally draining on the patient as well as the family. Fatigue may be accompanied by a generalized weakness, a sensation of limb heaviness, decreased ability to concentrate, sleeplessness, and/or irritability. People sometimes think that they are just being lazy or depressed, but fatigue can limit the ability to do everyday activities and enjoy life.

Many factors can contribute to cancer-related fatigue. A few simple tests, including a blood count to check for anemia or infection, thyroid function tests, and a physical examination, will help your healthcare provider to eliminate some immediately treatable causes for fatigue and make a diagnosis. Fatigue can be managed with a plan tailored to you and to the factors contributing to fatigue in your situation, such as muscle weakness or deconditioning, emotional distress, impaired sleep quality, or the side effects of sedating medications. Studies show that there are effective ways to manage cancer-related fatigue. They include the following.

Exercise

- With permission from your healthcare team, begin a program of physical activity such as walking, stretching, and cycling. Begin with 5–10 minutes twice daily, and increase the time by 1 minute per day. Do not be tempted to overdo exercise but, rather, strive for consistency.
- A moderate amount of exercise may actually help improve your energy level. Find a friend to walk with; he or she can encourage you to get out when you're tempted to stay in. An exercise trainer or physical therapist can also help with strengthening and building muscles and improving flexibility and balance.
- Consider a referral to a physical or occupational therapist, exercise physiologist, or physiatrist to develop and advance your exercise program. Rehabilitation programs may improve fatigue outcomes.

Gain Information About Fatigue and Its Management

- Learn more about your fatigue and talk to your family about ways they can be supportive.
- Differentiate facets of the fatigue experience (fatigue, tiredness, weakness, cognitive slowing) and discuss with your healthcare team.
- Keep a journal or diary of activities, fatigue severity, associated feelings/symptoms, and the effectiveness of self-management strategies.

Improve Sleep Quality

- Try to get undisturbed sleep. Go to bed at a regular time each day and follow a regular routine. The routine will begin to serve as a signal to your body that it's time for sleep.
- If you wake up at night because of pain or other symptoms, ask your team if your medication schedule can be adjusted to allow several hours of sleep at night.
- Substitute napping with other activities. Taking a daytime nap is almost a guarantee that you will have trouble sleeping at night. Try replacing a nap with relaxing activities like meditation, progressive muscle relaxation, or yoga. These activities can also help you avoid sleep troubles by reducing the anxiety and stress that also play a part in sleep difficulties.

Energy Conservation and Activity Management

Energy conservation means looking at your daily routines to find ways to reduce the amount of effort needed to perform certain tasks, eliminating other tasks, and alternating rest periods with activities throughout the day to prevent bursts of activity and discourage physical inactivity. Although not every technique will work for you, these are suggestions that you can consider.

(Continued on the next page)

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

Patient Education: Fatigue *(Continued)*

- Set priorities to reduce or eliminate tasks that are less important. Redefine "necessary" and sort out the really important activities from those that can wait.
- Schedule a daily routine to ensure pacing of activities and balance of rest and activity.
- Delegate or use labor-saving devices.
- Schedule activities for times of peak energy and mental concentration.
- Forgo jobs that need not be done every day, such as making beds.
- Ask your team about an occupational therapy evaluation to teach you energy-saving strategies.
- Keep a list of tasks that need to be done near your phone. When a neighbor, family member or friend asks what they can do to help, ask them!

Seek Help in Managing Stress, Concurrent Distressing Symptoms, and the Ups and Downs of the Cancer Experience

- Maintain open communication with your family and healthcare team about fatigue and its effects on daily life.
- Ask your nurse or doctor if your fatigue or other symptoms, such as pain or depression that contribute to your fatigue may be helped with medication. In addition to exploring the newest medical treatments for fatigue and other symptoms, you'll make your team aware of the severity of your tiredness.
- Consider participating in counseling or support groups.

Other approaches that are supported by evidence that could be considered for the treatment of fatigue include Wisconsin ginseng, yoga, and mindfulness-based stress reduction.

Approaches that have been evaluated but do not have enough research to recommend them include wakefulness-promoting agents such as modafinil or methylphenidate, acupuncture, massage, bright light therapy, and biofield therapies such as Reiki, therapeutic touch, qigong, or tai chi. In specific clinical circumstances, these approaches may still be helpful.

Note. Full Oncology Nursing Society Putting Evidence Into Practice information for this topic and description of the categories of evidence are located at www.ons.org/practice-resources/pep/fatigue. Users should refer to this resource for full dosages, references, and other essential information about the evidence.

Storek, Traore, & Thuss-Patience, 2014; Tsai et al., 2014); exposure to nature and green space (Nakau et al., 2013); moxibustion (He et al., 2013; Lee et al., 2014); distraction (virtual reality immersion) (Oyama, Kaneda, Katsumata, Akechi, & Ohsuga, 2000; Oyama, Ohsuga, Tatsuno, & Katsumata, 1999; Schneider, Ellis, Coombs, Shonkwiler, & Folsom, 2003; Schneider & Hood, 2007; Schneider, Prince-Paul, Allen, Silverman, & Talaba, 2004); and a combined-modality intervention that included aromatherapy, lavender foot soak, and reflexology (Kohara et al., 2004). The approaches have predominantly been studied using open-label and/or uncontrolled study designs and small sample sizes with no random assignment, making it difficult to draw conclusions about efficacy (Finnegan-John et al., 2013; Kwekkeboom et al., 2010; Shneerson, Taskila, Gale, Greenfield, & Chen, 2013). In addition, many of the interventions have been evaluated in combined-modality studies, so disentangling the effects of the separate components presents an additional constraint when interpreting the findings. Despite the limitations and with acknowledgment that inclusion of controls such as double-blinding presents methodologic challenges (Elam, Carpenter, Shu, Boyapati, & Friedmann-Gilchrist, 2006; Visser et al., 2011), further testing of these complementary approaches seems warranted.

Implications for Practice and Research

This review of the evidence for fatigue management during and following cancer treatment can be used by clinicians to broaden their therapeutic armamentarium and to develop individually tailored multimodal approaches to CRF management. Findings can be applied in the delivery of evidence-based supportive care, updating of evidence-based management guidelines (Bower et al., 2014; Howell et al., 2013), and national quality reporting programs as part of a learning healthcare system, as recommended by the Institute of Medicine (2013). This evidence review can also be used to guide clinical program development and to support health policy initiatives that improve access to and reimbursement for research-tested interventions for CRF, including access to comprehensive rehabilitation services and the delivery of supportive care interventions by advanced practice nurses.

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

Implications for Practice

- Individualize patients' fatigue management plan and align with their unique goals, tolerance, and therapeutic response to fatigue treatment.
- Suggest interventions that are recommended for practice or likely to be effective, such as exercise or physical activity, screening for treatable risk factors, management of concurrent symptoms, yoga, structured rehabilitation, Wisconsin ginseng, cognitive-behavioral therapy for sleep, and psychoeducational interventions.
- In individual circumstances, suggest massage, acupuncture, bright light therapy, biofield therapies (Reiki, therapeutic touch, haptotherapy, polarity therapy), qigong, or tai chi, and evaluate their effectiveness.

The analysis of the evidence suggests a number of implications for further CRF research. Many of the interventions for fatigue have had only limited study, often in uncontrolled pilot studies or single-site RCTs. Promising interventions, such as massage, biofield therapies, qigong, morning exposure to bright light, and acupuncture should receive continued study and refinement in rigorously designed, multisite trials. Interventions that are recommended for practice or likely to be effective, including exercise, psychoeducational interventions, and cognitive-behavioral therapies for sleep, fatigue, and concurrent symptoms, should be manualized to strengthen intervention fidelity and optimize widespread implementation and testing in pragmatic trials conducted in diverse community-based settings. Also indicated are RCTs to further evaluate therapies such as psychostimulants, MBSR, meditation, acupuncture, and energy conservation and activity management, where results have been mixed. Few RCTs include participants experiencing CRF in the context of multiple chronic conditions (Wright, Hammer, & Melkus, 2014) or those with advanced disease; as a result, research evidence is limited to support the feasibility, acceptability, and effectiveness of fatigue interventions for these specific subpopulations. This is particularly important because some evidence indicates that intervention programs that are lengthy or incorporate frequent treatment sessions may exacerbate fatigue in some patient populations, including those receiving radiation therapy (Brown et al., 2006) or those with advanced cancers (Dalton et al., 2004).

The limitations in drawing definitive conclusions about the effectiveness of several interventions suggest implications for the design of future CRF trials. Key study design decisions include whether a heterogeneous or homogeneous sample provides a better evaluation of efficacy (Sikorskii et al., 2014), whether fatigue-targeted criteria should be incorporated for study eligibility to enhance power (King, Ahn, Atienza, & Kraemer, 2008), and whether fatigue endpoint measures with well-established properties of precision and responsiveness such as the PROMIS Fatigue scale should be selected (Barsevick et al., 2013). Inclusion of congruent endpoints also enhances comparison of results across trials and permits formal meta-analysis. Intervention dose intensity and mechanism of action, treatment fidelity, patient preferences, and adequate statistical power are also important trial design considerations, particularly given that a number of the nonpharmacologic interventions incorporate individual tailoring (Ellis et al., 2012; Reich et al., 2014), include multiple components, and share an emphasis on progressive muscle relaxation, mindfulness, meditation, and controlled movement (Stan, Collins, Olsen, Croghan, & Pruthi, 2012).

Conclusion

As evidence-based treatment strategies for fatigue during and following cancer continue to evolve, clinicians are challenged to synthesize the evidence base and select the most effective strategies for intervention. The body of intervention research for CRF offers empirical and practical insights that clinicians can apply in their practices to achieve optimal management of this distressing symptom. This review also reveals gaps in the current knowledge and underscores the need for continued research to test and refine interventions that reduce fatigue and promote well-being in patients experiencing CRF.

The authors gratefully acknowledge Margaret Irwin, RN, PhD, Gail Mallory, RN, PhD, Mark Vrabel, MLS, AHIP, ELS, Susan L. Beck, PhD, APRN, AOCN®, Linda Edwards Hood, MSN, RN, AOCN®, Katen Moore, MSN, APRN, AOCN®, Ellen R. Tanner, RN, BSN, OCN®, and Linda H. Eaton, PhD, RN, AOCN®, for their contributions to the work reflected in this article.

References

Adamsen, L., Quist, M., Andersen, C., Møller, T., Herrstedt, J., Kronborg, D., . . . Rørth, M. (2009). Effect of a multimodal high intensity exercise intervention in cancer patients undergoing chemotherapy: Randomised controlled trial. *BMJ, 339,* b3410. doi:10.1136/bmj.b3410

Adamsen, L., Quist, M., Midtgaard, J., Andersen, C., Møller, T., Knutsen, L., . . . Rorth, M. (2006). The effect of a multidimensional exercise intervention on physical capacity, well-being and quality of life in cancer patients undergoing chemotherapy. *Supportive Care in Cancer, 14,* 116–127. doi:10.1007/s00520-005-0864-x

Aghabati, N., Mohammadi, E., & Pour Esmaiel, Z. (2010). The effect of therapeutic touch on pain and fatigue of cancer patients undergoing chemotherapy. *Evidence-Based Complementary and Alternative Medicine, 7,* 375–381. doi:10.1093/ecam/nen006

Ahles, T.A., Tope, D.M., Pinkson, B., Walch, S., Hann, D., Whedon, M., . . . Silberfarb, P.M. (1999). Massage therapy for patients undergoing autologous bone marrow transplantation. *Journal of Pain and Symptom Management, 18,* 157–163.

Allison, P.J., Edgar, L., Nicolau, B., Archer, J., Black, M., & Hier, M. (2004). Results of a feasibility study for a psycho-educational intervention in head and neck cancer. *Psycho-Oncology, 13,* 482–485. doi:10.1002/pon.816

Alvarez, J., Meyer, F.L., Granoff, D.L., & Lundy, A. (2013). The effect of EEG biofeedback on reducing postcancer cognitive impairment. *Integrative Cancer Therapies, 12,* 475–487. doi:10.1177/1534735413477192

Ancoli-Israel, S., Rissling, M., Neikrug, A., Trofimenko, V., Natarajan, L., Parker, B.A., . . . Liu, L. (2012). Light treatment prevents

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

fatigue in women undergoing chemotherapy for breast cancer. *Supportive Care in Cancer, 20,* 1211–1219. doi:10.1007/s00520-011-1203-z

Andersen, C., Rørth, M., Ejlertsen, B., Stage, M., Møller, T., Midtgaard, J., . . . Adamsen, L. (2013). The effects of a six-week supervised multimodal exercise intervention during chemotherapy on cancer-related fatigue. *European Journal of Oncology Nursing, 17,* 331–339. doi:10.1016/j.ejon.2012.09.003

Archer, S., Buxton, S., & Sheffield, D. (2014). The effect of creative psychological interventions on psychological outcomes for adult cancer patients: A systematic review of randomised controlled trials. *Psycho-Oncology.* Advanced online publication. doi:10.1002/pon.3607

Armes, J., Chalder, T., Addington-Hall, J., Richardson, A., & Hotopf, M. (2007). A randomized controlled trial to evaluate the effectiveness of a brief, behaviorally oriented intervention for cancer-related fatigue. *Cancer, 110,* 1385–1395. doi:10.1002/cncr.22923

Atkins, D., Best, D., Briss, P.A., Eccles, M., Falck-Ytter, Y., Flottorp, S., . . . Zaza, S. (2004). Grading quality of evidence and strength of recommendations. *BMJ, 328,* 1490. doi:10.1136/bmj.328.7454.1490

Azad, A., & John, T. (2013). Do randomized acupuncture studies in patients with cancer need a sham acupuncture control arm? *Journal of Clinical Oncology, 31,* 2057–2058. doi:10.1200/jco.2012.47.8750

Badger, T.A., Segrin, C., Figueredo, A.J., Harrington, J., Sheppard, K., Passalacqua, S., . . . Bishop, M. (2011). Psychosocial interventions to improve quality of life in prostate cancer survivors and their intimate or family partners. *Quality of Life Research, 20,* 833–844. doi:10.1007/s11136-010-9822-2

Baldwin, C., & Weekes, C.E. (2012). Dietary counselling with or without oral nutritional supplements in the management of malnourished patients: A systematic review and meta-analysis of randomised controlled trials. *Journal of Human Nutrition and Dietetics, 25,* 411–426. doi:10.1111/j.1365-277X.2012.01264.x

Bar-Sela, G., Atid, L., Danos, S., Gabay, N., & Epelbaum, R. (2007). Art therapy improved depression and influenced fatigue levels in cancer patients on chemotherapy. *Psycho-Oncology, 16,* 980–984. doi:10.1002/pon.1175

Barsevick, A., Beck, S.L., Dudley, W.N., Wong, B., Berger, A.M., Whitmer, K., . . . Stewart, K. (2010). Efficacy of an intervention for fatigue and sleep disturbance during cancer chemotherapy. *Journal of Pain and Symptom Management, 40,* 200–216. doi:10.1016/j.jpainsymman.2009.12.020

Barsevick, A.M., Dudley, W., Beck, S., Sweeney, C., Whitmer, K., & Nail, L. (2004). A randomized clinical trial of energy conservation for patients with cancer-related fatigue. *Cancer, 100,* 1302–1310. doi:10.1002/cncr.20111

Barsevick, A.M., Irwin, M.R., Hinds, P., Miller, A., Berger, A., Jacobsen, P., . . . Cella, D. (2013). Recommendations for high-priority research on cancer-related fatigue in children and adults. *Journal of the National Cancer Institute, 105,* 1432–1440. doi:10.1093/jnci/djt242

Barton, D. (2014). Journey to Oz in search of a remedy for fatigue. *Cancer Journal, 20,* 15–17. doi:10.1097/ppo.0000000000000019

Barton, D.L., Atherton, P.J., Bauer, B.A., Moore, D.F., Jr., Mattar, B.I., Lavasseur, B.I., . . . Loprinzi, C.L. (2011). The use of Valeriana officinalis (Valerian) in improving sleep in patients who are undergoing treatment for cancer: A phase III randomized, placebo-controlled, double-blind study (NCCTG Trial, N01C5). *Journal of Supportive Oncology, 9,* 24–31. doi:10.1016/j.suponc.2010.12.008

Barton, D.L., Liu, H., Dakhil, S.R., Linquist, B., Sloan, J.A., Nichols, C.R., . . . Loprinzi, C.L. (2013). Wisconsin Ginseng (Panax quinquefolius) to improve cancer-related fatigue: A randomized, double-blind trial, N07C2. *Journal of the National Cancer Institute, 105,* 1230–1238. doi:10.1093/jnci/djt181

Bertheussen, G.F., Kaasa, S., Hokstad, A., Sandmæl, J.A., Helbostad, J.L., Salvesen, Ø., & Oldervoll, L.M. (2012). Feasibility and changes in symptoms and functioning following inpatient cancer rehabilitation. *Acta Oncologica, 51,* 1070–1080. doi:10.3109/0284186x.2012.699684

Björneklett, H.G., Lindemalm, C., Ojutkangas, M.L., Berglund, A., Letocha, H., Strang, P., & Bergkvist, L. (2012). A randomized controlled trial of a support group intervention on the quality of life and fatigue in women after primary treatment for early breast cancer. *Supportive Care in Cancer, 20,* 3325–3334. doi:10.1007/s00520-012-1480-1

Blackhall, L., Petroni, G., Shu, J., Baum, L., & Farace, E. (2009). A pilot study evaluating the safety and efficacy of modafinal for cancer-related fatigue. *Journal of Palliative Medicine, 12,* 433–439. doi:10.1089/jpm.2008.0230

Boele, F.W., Douw, L., de Groot, M., van Thuijl, H.F., Cleijne, W., Heimans, J.J., . . . Klein, M. (2013). The effect of modafinil on fatigue, cognitive functioning, and mood in primary brain tumor patients: A multicenter randomized controlled trial. *Neuro-Oncology, 15,* 1420–1428. doi:10.1093/neuonc/not102

Boesen, E.H., Ross, L., Frederiksen, K., Thomsen, B.L., Dahlstrøm, K., Schmidt, G., . . . Johansen, C. (2005). Psychoeducational intervention for patients with cutaneous malignant melanoma: A replication study. *Journal of Clinical Oncology, 23,* 1270–1277. doi:10.1200/JCO.2005.05.193

Bohlius, J., Tonia, T., Nüesch, E., Jüni, P., Fey, M.F., Egger, M., & Bernhard, J. (2014). Effects of erythropoiesis-stimulating agents on fatigue- and anaemia-related symptoms in cancer patients: Systematic review and meta-analyses of published and unpublished data. *British Journal of Cancer, 111,* 33–45. doi:10.1038/bjc.2014.171

Bohlius, J., Tonia, T., & Schwarzer, G. (2011). Twist and shout: One decade of meta-analyses of erythropoiesis-stimulating agents in cancer patients. *Acta Haematologica, 125,* 55–67. doi:10.1159/000318897

Bormanis, J., Quirt, I., Chang, J., Kouroukis, C.T., MacDonald, D., Melosky, B., . . . Couture, F. (2013). Erythropoiesis-stimulating agents (ESAs): Do they still have a role in chemotherapy-induced anemia (CIA)? *Critical Reviews in Oncology/Hematology, 87,* 132–139. doi:10.1016/j.critrevonc.2012.12.010

Boulaamane, L., Goncalves, A., Boutayeb, S., Viens, P., M'rabti, H., Bertucci, F., & Errihani, H. (2013). Prognostic impact of the combination of erythropoiesis-stimulating agents to cancer treatment: Literature review. *Supportive Care in Cancer, 21,* 2359–2369. doi:10.1007/s00520-013-1866-8

Bower, J.E., Bak, K., Berger, A., Breitbart, W., Escalante, C.P., Ganz, P.A., . . . Jacobsen, P.B. (2014). Screening, assessment, and management of fatigue in adult survivors of cancer: An American Society of Clinical Oncology clinical practice guideline adaptation. *Journal of Clinical Oncology, 32,* 1840–1850. doi:10.1200/jco.2013.53.4495

Bower, J.E., Garet, D., & Sternlieb, B. (2011). Yoga for persistent fatigue in breast cancer survivors: Results of a pilot study. *Evidence-Based Complementary and Alternative Medicine, 2011,* 623168. doi:10.1155/2011/623168

Bozcuk, H., Artac, M., Kara, A., Ozdogan, M., Sualp, Y., Topcu, Z., . . . Savas, B. (2006). Does music exposure during chemotherapy

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

improve quality of life in early breast cancer patients? A pilot study. *Medical Science Monitor, 12,* CR200-CR205.

Braam, K.I., van der Torre, P., Takken, T., Veening, M.A., van Dulmen-den Broeder, E., & Kaspers, G.J. (2013). Physical exercise training interventions for children and young adults during and after treatment for childhood cancer. *Cochrane Database of Systematic Reviews, 4,* CD008796. doi:10.1002/14651858.CD008796.pub2

Bradt, J., Dileo, C., Grocke, D., & Magill, L. (2011). Music interventions for improving psychological and physical outcomes in cancer patients. *Cochrane Database of Systematic Reviews, 8,* CD006911. doi:10.1002/14651858.CD006911.pub2

Breitbart, W., & Alici, Y. (2008). Pharmacologic treatment options for cancer-related fatigue: Current state of clinical research. *Clinical Journal of Oncology Nursing, 12*(5 Suppl.), 27–36. doi:10.1188/08.CJON.S2.27-36

Breitbart, W., & Alici, Y. (2010). Psychostimulants for cancer-related fatigue. *Journal of the National Comprehensive Cancer Network, 8,* 933–942.

Breitbart, W., & Alici-Evcimen, Y. (2007). Update on psychotropic medications for cancer-related fatigue. *Journal of the National Comprehensive Cancer Network, 5,* 1081–1091.

Brothers, B.M., Yang, H.C., Strunk, D.R., & Andersen, B.L. (2011). Cancer patients with major depressive disorder: Testing a biobehavioral/cognitive behavior intervention. *Journal of Consulting and Clinical Psychology, 79,* 253–260. doi:10.1037/a0022566

Brown, J.C., Huedo-Medina, T.B., Pescatello, L.S., Pescatello, S.M., Ferrer, R.A., & Johnson, B.T. (2011). Efficacy of exercise interventions in modulating cancer-related fatigue among adult cancer survivors: A meta-analysis. *Cancer Epidemiology, Biomarkers and Prevention, 20,* 123–133. doi:10.1158/1055-9965.epi-10-0988

Brown, P., Clark, M.M., Atherton, P., Huschka, M., Sloan, J.A., Gamble, G., . . . Rummans, T.A. (2006). Will improvement in quality of life (QOL) impact fatigue in patients receiving radiation therapy for advanced cancer? *American Journal of Clinical Oncology, 29,* 52–58. doi:10.1097/01.coc.0000190459.14841.55

Bruera, E., El Osta, B., Valero, V., Driver, L.C., Pei, B.L., Shen, L., . . . Palmer, J.L. (2007). Donepezil for cancer fatigue: A double-blind, randomized, placebo-controlled trial. *Journal of Clinical Oncology, 25,* 3475–3481. doi:10.1200/JCO.2007.10.9231

Bruera, E., Ernst, S., Hagen, N., Spachynski, K., Belzile, M., Hanson, J., . . . Gallant, G. (1998). Effectiveness of megestrol acetate in patients with advanced cancer: A randomized, double-blind, crossover study. *Cancer Prevention and Control, 2*(2), 74–78.

Bruera, E., Strasser, F., Shen, L., Palmer, J.L., Willey, J., Driver, L.C., & Burton, A.W. (2003). The effect of donepezil on sedation and other symptoms in patients receiving opioids for cancer pain: A pilot study. *Journal of Pain and Symptom Management, 26,* 1049–1054.

Bruera, E., Valero, V., Driver, L., Shen, L., Willey, J., Zhang, T., & Palmer, J.L. (2006). Patient-controlled methylphenidate for cancer fatigue: A double-blind, randomized, placebo-controlled trial. *Journal of Clinical Oncology, 24,* 2073–2078. doi:10.1200/JCO.2005.02.8506

Bruera, E., Yennurajalingam, S., Palmer, J.L., Perez-Cruz, P.E., Frisbee-Hume, S., Allo, J.A., . . . Cohen, M.Z. (2013). Methylphenidate and/or a nursing telephone intervention for fatigue in patients with advanced cancer: A randomized, placebo-controlled, phase II trial. *Journal of Clinical Oncology, 31,* 2421–2427. doi:10.1200/jco.2012.45.3696

Buffart, L.M., van Uffelen, J.G., Riphagen, I.I., Brug, J., van Mechelen, W., Brown, W.J., & Chinapaw, M.J. (2012). Physical and psychosocial benefits of yoga in cancer patients and survivors, a systematic review and meta-analysis of randomized controlled trials. *BMC Cancer, 12,* 559. doi:10.1186/1471-2407-12-559

Campo, R.A., Agarwal, N., LaStayo, P.C., O'Connor, K., Pappas, L., Boucher, K.M., . . . Kinney, A.Y. (2014). Levels of fatigue and distress in senior prostate cancer survivors enrolled in a 12-week randomized controlled trial of Qigong. *Journal of Cancer Survivorship, 8,* 60–69. doi:10.1007/s11764-013-0315-5

Campos, M.P., Hassan, B.J., Riechelmann, R., & Del Giglio, A. (2011). Cancer-related fatigue: A practical review. *Annals of Oncology, 22,* 1273–1279. doi:10.1093/annonc/mdq458

Cantarero-Villanueva, I., Fernández-Lao, C., Del Moral-Avila, R., Fernández-de-Las-Peñas, C., Feriche-Fernández-Castanys, M.B., & Arroyo-Morales, M. (2012). Effectiveness of core stability exercises and recovery myofascial release massage on fatigue in breast cancer survivors: A randomized controlled clinical trial. *Evidence-Based Complementary and Alternative Medicine, 2012,* 620619. doi:10.1155/2012/620619

Capuron, L., Gumnick, J.F., Musselman, D.L., Lawson, D.H., Reemsnyder, A., Nemeroff, C.B., & Miller, A.H. (2002). Neurobehavioral effects of interferon-alpha in cancer patients: Phenomenology and paroxetine responsiveness of symptom dimensions. *Neuropsychopharmacology, 26,* 643–652. doi:10.1016/S0893-133X(01)00407-9

Carlson, L.E., & Garland, S.N. (2005). Impact of mindfulness-based stress reduction (MBSR) on sleep, mood, stress and fatigue symptoms in cancer outpatients. *International Journal of Behavioral Medicine, 12,* 278–285. doi:10.1207/s15327558ijbm1204_9

Carlson, L.E., Speca, M., Patel, K.D., & Goodey, E. (2003). Mindfulness-based stress reduction in relation to quality of life, mood, symptoms of stress, and immune parameters in breast and prostate cancer outpatients. *Psychosomatic Medicine, 65,* 571–581.

Carpenter, J.S., Storniolo, A.M., Johns, S., Monahan, P.O., Azzouz, F., Elam, J.L., . . . Shelton, R.C. (2007). Randomized, double-blind, placebo-controlled crossover trials of venlafaxine for hot flashes after breast cancer. *Oncologist, 12,* 124–135. doi:10.1634/theoncologist.12-1-124

Carson, J.W., Carson, K.M., Porter, L.S., Keefe, F.J., & Seewaldt, V.L. (2009). Yoga of Awareness program for menopausal symptoms in breast cancer survivors: Results from a randomized trial. *Supportive Care in Cancer, 17,* 1301–1309. doi:10.1007/s00520-009-0587-5

Carson, J.W., Carson, K.M., Porter, L.S., Keefe, F.J., Shaw, H., & Miller, J.M. (2007). Yoga for women with metastatic breast cancer: Results from a pilot study. *Journal of Pain and Symptom Management, 33,* 331–341. doi:10.1016/j.jpainsymman.2006.08.009

Chan, C.W., Richardson, A., & Richardson, J. (2011). Managing symptoms in patients with advanced lung cancer during radiotherapy: Results of a psychoeducational randomized controlled trial. *Journal of Pain and Symptom Management, 41,* 347–357. doi:10.1016/j.jpainsymman.2010.04.024

Chandwani, K.D., Perkins, G., Nagendra, H.R., Raghuram, N.V., Spelman, A., Nagarathna, R., . . . Cohen, L. (2014). Randomized, controlled trial of yoga in women with breast cancer undergoing radiotherapy. *Journal of Clinical Oncology, 32,* 1058–1065. doi:10.1200/jco.2012.48.2752

Chasen, M.R., & Bhargava, R. (2010). A rehabilitation program for patients with gastroesophageal cancer: A pilot study. *Supportive Care in Cancer, 18*(Suppl. 2), S35–S40. doi:10.1007/s00520-010-0828-7

Chasen, M.R., Feldstain, A., Gravelle, D., Macdonald, N., & Pereira, J. (2013). An interprofessional palliative care oncology

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

rehabilitation program: Effects on function and predictors of program completion. *Current Oncology, 20,* 301–309. doi:10.3747/co.20.1607

Chen, H.W., Lin, I.H., Chen, Y.J., Chang, K.H., Wu, M.H., Su, W.H., . . . Lai, Y.L. (2012). A novel infusible botanically-derived drug, PG2, for cancer-related fatigue: A phase II double-blind, randomized placebo-controlled study. *Clinical and Investigative Medicine, 35*(1), E1–E11.

Chen, Z., Meng, Z., Milbury, K., Bei, W., Zhang, Y., Thornton, B., . . . Cohen, L. (2013). Qigong improves quality of life in women undergoing radiotherapy for breast cancer: Results of a randomized controlled trial. *Cancer, 119,* 1690–1698. doi:10.1002/cncr.27904

Cheville, A.L., Girardi, J., Clark, M.M., Rummans, T.A., Pittelkow, T., Brown, P., . . . Gamble, G. (2010). Therapeutic exercise during outpatient radiation therapy for advanced cancer: Feasibility and impact on physical well-being. *American Journal of Physical Medicine and Rehabilitation, 89,* 611–619. doi:10.1097/PHM.0b013e3181d3e782

Chien, T.J., Liu, C.Y., & Hsu, C.H. (2013). Integrating acupuncture into cancer care. *Journal of Traditional and Complementary Medicine, 3,* 234–239. doi:10.4103/2225-4110.119733

Clark, M., Isaacks-Downton, G., Wells, N., Redlin-Frazier, S., Eck, C., Hepworth, J.T., & Chakravarthy, B. (2006). Use of preferred music to reduce emotional distress and symptom activity during radiation therapy. *Journal of Music Therapy, 43,* 247–265.

Cohen, L., Warneke, C., Fouladi, R.T., Rodriguez, M.A., & Chaoul-Reich, A. (2004). Psychological adjustment and sleep quality in a randomized trial of the effects of a Tibetan yoga intervention in patients with lymphoma. *Cancer, 100,* 2253–2260. doi:10.1002/cncr.20236

Cohen, M., & Fried, G. (2007). Comparing relaxation training and cognitive-behavioral group therapy for women with breast cancer. *Research on Social Work Practice, 17,* 313–323. doi:10.1177/1049731506293741

Courneya, K.S., Friedenreich, C.M., Sela, R.A., Quinney, H.A., Rhodes, R.E., & Handman, M. (2003). The group psychotherapy and home-based physical exercise (group-hope) trial in cancer survivors: Physical fitness and quality of life outcomes. *Psycho-Oncology, 12,* 357–374. doi:10.1002/pon.658

Cramer, H., Lauche, R., Klose, P., Dobos, G., & Langhorst, J. (2014). A systematic review and meta-analysis of exercise interventions for colorectal cancer patients. *European Journal of Cancer Care, 23,* 3–14. doi:10.1111/ecc.12093

Cramer, H., Lauche, R., Paul, A., Langhorst, J., Kummel, S., & Dobos, G. J. (2014). Hypnosis in Breast Cancer Care: A Systematic Review of Randomized Controlled Trials. *Integrative Cancer Therapies*. Advance online publication. doi:10.1177/1534735414550035

Cramp, F., & Byron-Daniel, J. (2012). Exercise for the management of cancer-related fatigue in adults. *Cochrane Database of Systematic Reviews, 11,* CD006145. doi:10.1002/14651858.CD006145.pub3

Crandall, K., Maguire, R., Campbell, A., & Kearney, N. (2014). Exercise intervention for patients surgically treated for non-small cell lung cancer (NSCLC): A systematic review. *Surgical Oncology, 23*(1), 17–30. doi:10.1016/j.suronc.2014.01.00

Cruciani, R.A., Dvorkin, E., Homel, P., Culliney, B., Malamud, S., Lapin, J., . . . Esteban-Cruciani, N. (2009). L-carnitine supplementation in patients with advanced cancer and carnitine deficiency: A double-blind, placebo-controlled study. *Journal of Pain and Symptom Management, 37,* 622–631. doi:10.1016/j.jpainsymman.2008.03.021

Cruciani, R.A., Dvorkin, E., Homel, P., Culliney, B., Malamud, S., Shaiova, L., . . . Esteban-Cruciani, N. (2004). L-carnitine supplementation for the treatment of fatigue and depressed mood in cancer patients with carnitine deficiency: A preliminary analysis. *Annals of the New York Academy Sciences, 1033,* 168–176. doi:10.1196/annals.1320.016

Cruciani, R.A., Dvorkin, E., Homel, P., Malamud, S., Culliney, B., Lapin, J., . . . Esteban-Cruciani, N. (2006). Safety, tolerability and symptom outcomes associated with L-carnitine supplementation in patients with cancer, fatigue, and carnitine deficiency: A phase I/II study. *Journal of Pain and Symptom Management, 32,* 551–559. doi:10.1016/j.jpainsymman.2006.09.001

Cruciani, R.A., Zhang, J.J., Manola, J., Cella, D., Ansari, B., & Fisch, M.J. (2012). L-carnitine supplementation for the management of fatigue in patients with cancer: An Eastern Cooperative Oncology Group phase III, randomized, double-blind, placebo-controlled trial. *Journal of Clinical Oncology, 30,* 3864–3869. doi:10.1200/jco.2011.40.2180

Cuesta-Vargas, A.I., Buchan, J., & Arroyo-Morales, M. (2014). A multimodal physiotherapy programme plus deep water running for improving cancer-related fatigue and quality of life in breast cancer survivors. *European Journal of Cancer Care, 23,* 15–21. doi:10.1111/ecc.12114

Cullum, J.L., Wojciechowski, A.E., Pelletier, G., & Simpson, J.S. (2004). Bupropion sustained release treatment reduces fatigue in cancer patients. *Canadian Journal of Psychiatry, 49,* 139–144.

Culos-Reed, S.N., Robinson, J.W., Lau, H., Stephenson, L., Keats, M., Norris, S., . . . Faris, P. (2010). Physical activity for men receiving androgen deprivation therapy for prostate cancer: Benefits from a 16-week intervention. *Supportive Care in Cancer, 18,* 591–599. doi:10.1007/s00520-009-0694-3

Currin, J., & Meister, E.A. (2008). A hospital-based intervention using massage to reduce distress among oncology patients. *Cancer Nursing, 31,* 214–221. doi:10.1097/01.NCC.0000305725.65345.f3

da Costa Miranda, V., Trufelli, D.C., Santos, J., Campos, M.P., Nobuo, M., da Costa Miranda, M., . . . del Giglio, A. (2009). Effectiveness of guarana (Paullinia cupana) for postradiation fatigue and depression: Results of a pilot double-blind randomized study. *Journal of Alternative and Complementary Medicine, 15,* 431–433. doi:10.1089/acm.2008.0324

Dalton, J.A., Keefe, F.J., Carlson, J., & Youngblood, R. (2004). Tailoring cognitive-behavioral treatment for cancer pain. *Pain Management Nursing, 5,* 3–18.

Decker, T.W., Cline-Elsen, J., & Gallagher, M. (1992). Relaxation therapy as an adjunct in radiation oncology. *Journal of Clinical Psychology, 48,* 388–393.

Del Fabbro, E., Garcia, J.M., Dev, R., Hui, D., Williams, J., Engineer, D., . . . Bruera, E. (2013). Testosterone replacement for fatigue in hypogonadal ambulatory males with advanced cancer: A preliminary double-blind placebo-controlled trial. *Supportive Care in Cancer, 21,* 2599–2607. doi:10.1007/s00520-013-1832-5

del Giglio, A.B., Cubero Dde, I., Lerner, T.G., Guariento, R.T., de Azevedo, R.G., Paiva, H., . . . del Giglio, A. (2013). Purified dry extract of Paullinia cupana (guaraná) (PC-18) for chemotherapy-related fatigue in patients with solid tumors: An early discontinuation study. *Journal of Dietary Supplements, 10,* 325–334. doi:10.3109/19390211.2013.830676

Demiralp, M., Oflaz, F., & Komurcu, S. (2010). Effects of relaxation training on sleep quality and fatigue in patients with breast cancer undergoing adjuvant chemotherapy. *Journal of Clinical Nursing, 19,* 1073–1083. doi:10.1111/j.1365-2702.2009.03037.x

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

de Moor, C., Sterner, J., Hall, M., Warneke, C., Gilani, Z., Amato, R., & Cohen, L. (2002). A pilot study of the effects of expressive writing on psychological and behavioral adjustment in patients enrolled in a phase II trial of vaccine therapy for metastatic renal cell carcinoma. *Health Psychology, 21,* 615–619.

de Oliveira Campos, M.P., Riechelmann, R., Martins, L.C., Hassan, B.J., Casa, F.B., & Del Giglio, A. (2011). Guarana (Paullinia cupana) improves fatigue in breast cancer patients undergoing systemic chemotherapy. *Journal of Alternative and Complementary Medicine, 17,* 505–512. doi:10.1089/acm.2010.0571

de Raaf, P.J., de Klerk, C., Timman, R., Busschbach, J.J., Oldenmenger, W.H., & van der Rijt, C.C. (2013). Systematic monitoring and treatment of physical symptoms to alleviate fatigue in patients with advanced cancer: A randomized controlled trial. *Journal of Clinical Oncology, 31,* 716–723. doi:10.1200/jco.2012.44.4216

de Raaf, P.J., de Klerk, C., & van der Rijt, C.C. (2013). Elucidating the behavior of physical fatigue and mental fatigue in cancer patients: A review of the literature. *Psycho-Oncology, 22,* 1919–1929. doi:10.1002/pon.3225

de Souza Fede, A.B., Bensi, C.G., Trufelli, D.C., de Oliveira Campos, M.P., Pecoroni, P.G., Ranzatti, R.P., . . . Del Giglio, A. (2007). Multivitamins do not improve radiation therapy-related fatigue: Results of a double-blind randomized crossover trial. *American Journal of Clinical Oncology, 30,* 432–436. doi:10.1097/COC.0b013e31804b40d9

Dhruva, A., Aouizerat, B.E., Cooper, B., Paul, S.M., Dodd, M., West, C., . . . Miaskowski, C. (2013). Differences in morning and evening fatigue in oncology patients and their family caregivers. *European Journal of Oncology Nursing, 17,* 841–848. doi:10.1016/j.ejon.2013.06.002

Dhruva, A., Miaskowski, C., Abrams, D., Acree, M., Cooper, B., Goodman, S., & Hecht, F.M. (2012). Yoga breathing for cancer chemotherapy-associated symptoms and quality of life: Results of a pilot randomized controlled trial. *Journal of Alternative and Complementary Medicine, 18,* 473–479. doi:10.1089/acm.2011.0555

Dirksen, S.R., & Epstein, D.R. (2008). Efficacy of an insomnia intervention on fatigue, mood and quality of life in breast cancer survivors. *Journal of Advanced Nursing, 61,* 664–675. doi:10.1111/j.1365-2648.2007.04560.x

Dolbeault, S., Cayrou, S., Brédart, A., Viala, A.L., Desclaux, B., Saltel, P., . . . Dickes, P. (2009). The effectiveness of a psycho-educational group- after early-stage breast cancer treatment: Results of a randomized French study. *Psycho-Oncology, 18,* 647–656. doi:10.1002/pon.1440

Donnelly, C.M., Blaney, J.M., Lowe-Strong, A., Rankin, J.P., Campbell, A., McCrum-Gardner, E., & Gracey, J.H. (2011). A randomised controlled trial testing the feasibility and efficacy of a physical activity behavioural change intervention in managing fatigue with gynaecological cancer survivors. *Gynecologic Oncology, 122,* 618–624. doi:10.1016/j.ygyno.2011.05.029

Duijts, S.F., Faber, M.M., Oldenburg, H.S., van Beurden, M., & Aaronson, N.K. (2011). 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, 20,* 115-126. doi:10.1002/pon.1728

Egan, M.Y., McEwen, S., Sikora, L., Chasen, M., Fitch, M., & Eldred, S. (2013). Rehabilitation following cancer treatment. *Disability and Rehabilitation, 35,* 2245–2258. doi:10.3109/09638288.2013.774441

Eickmeyer, S.M., Gamble, G.L., Shahpar, S., & Do, K.D. (2012). The role and efficacy of exercise in persons with cancer. *PM&R, 4,* 874–881. doi:10.1016/j.pmrj.2012.09.588

Elam, J.L., Carpenter, J.S., Shu, X.O., Boyapati, S., & Friedmann-Gilchrist, J. (2006). Methodological issues in the investigation of ginseng as an intervention for fatigue. *Clinical Nurse Specialist, 20,* 183–189.

Ellis, J., Wagland, R., Tishelman, C., Williams, M.L., Bailey, C.D., Haines, J., . . . Molassiotis, A. (2012). Considerations in developing and delivering a nonpharmacological intervention for symptom management in lung cancer: The views of patients and informal caregivers. *Journal of Pain and Symptom Management, 44,* 831–842. doi:10.1016/j.jpainsymman.2011.12.274

Ernst, E. (2009). Massage therapy for cancer palliation and supportive care: A systematic review of randomised clinical trials. *Supportive Care in Cancer, 17,* 333–337. doi:10.1007/s00520-008-0569-z

Ernst, E., & Posadzki, P. (2013). Reply to Molassiotis. *Supportive Care in Cancer, 21,* 3257. doi:10.1007/s00520-013-1990-5

Escalante, C.P., Meyers, C., Reuben, J.M., Wang, X., Qiao, W., Manzullo, E., . . . Cleeland, C. (2014). A randomized, double-blind, 2-period, placebo-controlled crossover trial of a sustained-release methylphenidate in the treatment of fatigue in cancer patients. *Cancer Journal, 20,* 8–14. doi:10.1097/ppo.0000000000000018

Espie, C.A., Fleming, L., Cassidy, J., Samuel, L., Taylor, L.M., White, C.A., . . . Paul, J. (2008). Randomized controlled clinical effectiveness trial of cognitive behavior therapy compared with treatment as usual for persistent insomnia in patients with cancer. *Journal of Clinical Oncology, 26,* 4651–4658. doi:10.1200/JCO.2007.13.9006

Eton, D.T., & Cella, D. (2011). Do erythropoietic-stimulating agents relieve fatigue? A review of reviews. *Cancer Treatment and Research, 157,* 181–194. doi:10.1007/978-1-4419-7073-2_11

Fawzy, F.I., Cousins, N., Fawzy, N.W., Kemeny, M.E., Elashoff, R., & Morton, D. (1990). A structured psychiatric intervention for cancer patients. I. Changes over time in methods of coping and affective disturbance. *Archives of General Psychiatry, 47,* 720–725.

Felbel, S., Meerpohl, J.J., Monsef, I., Engert, A., & Skoetz, N. (2014). Yoga in addition to standard care for patients with haematological malignancies. *Cochrane Database of Systematic Reviews, 6,* CD010146. doi:10.1002/14651858.CD010146.pub2

Fernández-Lao, C., Cantarero-Villanueva, I., Diaz-Rodriguez, L., Cuesta-Vargas, A.I., Fernández-Delas-Peñas, C., & Arroyo-Morales, M. (2012). Attitudes towards massage modify effects of manual therapy in breast cancer survivors: A randomised clinical trial with crossover design. *European Journal of Cancer Care, 21,* 233–241. doi:10.1111/j.1365-2354.2011.01306.x

Fillion, L., Gagnon, P., Leblond, F., Gélinas, C., Savard, J., Dupuis, R., . . . Larochelle, M. (2008). A brief intervention for fatigue management in breast cancer survivors. *Cancer Nursing, 31,* 145–159. doi:10.1097/01.ncc.0000305698.97625.95

Finnegan-John, J., Molassiotis, A., Richardson, A., & Ream, E. (2013). A systematic review of complementary and alternative medicine interventions for the management of cancer-related fatigue. *Integrative Cancer Therapies, 12,* 276–290.

FitzHenry, F., Wells, N., Slater, V., Dietrich, M.S., Wisawatapnimit, P., & Chakravarthy, A.B. (2014). A randomized placebo-controlled pilot study of the impact of healing touch on fatigue in breast cancer patients undergoing radiation therapy. *Integrative Cancer Therapies, 13,* 105–113. doi:10.1177/1534735413503545

Fleming, L., Randell, K., Harvey, C.J., & Espie, C.A. (2014). Does cognitive behaviour therapy for insomnia reduce clinical levels

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

of fatigue, anxiety and depression in cancer patients? *Psycho-Oncology, 23,* 679–684. doi:10.1002/pon.3468

Focht, B.C., Clinton, S.K., Devor, S.T., Garver, M.J., Lucas, A.R., Thomas-Ahner, J.M., & Grainger, E. (2013). Resistance exercise interventions during and following cancer treatment: A systematic review. *Journal of Supportive Oncology, 11*(2), 45–60.

Fong, D.Y., Ho, J.W., Hui, B.P., Lee, A.M., Macfarlane, D.J., Leung, S.S., . . . Cheng, K.K. (2012). Physical activity for cancer survivors: Meta-analysis of randomised controlled trials. *BMJ, 344,* e70. doi:10.1136/bmj.e70

Fors, E.A., Bertheussen, G.F., Thune, I., Juvet, L.K., Elvsaas, I.K., Oldervoll, L., . . . Leivseth, G. (2011). Psychosocial interventions as part of breast cancer rehabilitation programs? Results from a systematic review. *Psycho-Oncology, 20,* 909–918. doi:10.1002/pon.1844

Franco, M., William, L., Poon, P., & Azad, A. (2014). Dexamethasone for cancer-related fatigue. *Journal of Clinical Oncology, 32,* 608–609. doi:10.1200/jco.2013.53.7878

Gagnon, B., Murphy, J., Eades, M., Lemoignan, J., Jelowicki, M., Carney, S., . . . Macdonald, N. (2013). A prospective evaluation of an interdisciplinary nutrition-rehabilitation program for patients with advanced cancer. *Current Oncology, 20,* 310–318. doi:10.3747/co.20.1612

Galantino, M.L., Callens, M.L., Cardena, G.J., Piela, N.L., & Mao, J.J. (2013). Tai chi for well-being of breast cancer survivors with aromatase inhibitor-associated arthralgias: A feasibility study. *Alternative Therapies in Health and Medicine, 19,* 38–44.

Gao, S., Ma, J.J., & Lu, C. (2013). Venous thromboembolism risk and erythropoiesis-stimulating agents for the treatment of cancer-associated anemia: A meta-analysis. *Tumour Biology, 35,* 603–613. doi:10.1007/s13277-013-1084-5

Garcia, M.K., McQuade, J., Haddad, R., Patel, S., Lee, R., Yang, P., . . . Cohen, L. (2013). Systematic review of acupuncture in cancer care: A synthesis of the evidence. *Journal of Clinical Oncology, 31,* 952–960. doi:10.1200/jco.2012.43.5818

Garland, S.N., Johnson, J.A., Savard, J., Gehrman, P., Perlis, M., Carlson, L., & Campbell, T. (2014). Sleeping well with cancer: A systematic review of cognitive behavioral therapy for insomnia in cancer patients. *Neuropsychiatric Disease and Treatment, 10,* 1113–1124. doi:10.2147/ndt.s47790

Garssen, B., Boomsma, M.F., Meezenbroek Ede, J., Porsild, T., Berkhof, J., Berbee, M., . . . Beelen, R.H. (2013). Stress management training for breast cancer surgery patients. *Psycho-Oncology, 22,* 572–580. doi:10.1002/pon.3034

Gielissen, M.F., Verhagen, S., Witjes, F., & Bleijenberg, G. (2006). Effects of cognitive behavior therapy in severely fatigued disease-free cancer patients compared with patients waiting for cognitive behavior therapy: A randomized controlled trial. *Journal of Clinical Oncology, 24,* 4882–4887.

Gielissen, M.F., Wiborg, J.F., Verhagen, C.A., Knoop, H., & Bleijenberg, G. (2012). Examining the role of physical activity in reducing postcancer fatigue. *Supportive Care in Cancer, 20,* 1441–1447. doi:10.1007/s00520-011-1227-4

Given, B., Given, C.W., McCorkle, R., Kozachik, S., Cimprich, B., Rahbar, M.H., & Wojcik, C. (2002). Pain and fatigue management: Results of a nursing randomized clinical trial. *Oncology Nursing Forum, 29,* 949–956. doi:10.1188/02.ONF.949-956

Gjerset, G.M., Fossa, S.D., Dahl, A.A., Loge, J.H., Ensby, T., & Thorsen, L. (2011). Effects of a 1-week inpatient course including information, physical activity, and group sessions for prostate cancer patients. *Journal of Cancer Education, 26,* 754–760. doi:10.1007/s13187-011-0245-8

Godino, C., Jodar, L., Durán, A., Martinez, I., & Schiaffino, A. (2006). Nursing education as an intervention to decrease fatigue perception in oncology patients. *European Journal of Oncology Nursing, 10,* 150–155. doi:10.1016/j.ejon.2005.03.004

Goedendorp, M.M., Gielissen, M.F., Verhagen, C.A., & Bleijenberg, G. (2009). Psychosocial interventions for reducing fatigue during cancer treatment in adults. *Cochrane Database of Systematic Reviews,* CD006953. doi:10.1002/14651858.CD006953.pub2

Goedendorp, M.M., Peters, M.E., Gielissen, M.F., Witjes, J.A., Leer, J.W., Verhagen, C.A., & Bleijenberg, G. (2010). 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. *Oncologist, 15,* 1122–1132. doi:10.1634/theoncologist.2010-0092

Gong, S., Sheng, P., Jin, H., He, H., Qi, E., Chen, W., . . . Hou, L. (2014). Effect of methylphenidate in patients with cancer-related fatigue: A systematic review and meta-analysis. *PLOS ONE, 9,* e84391. doi:10.1371/journal.pone.0084391

Goodwin, P.J., Leszcz, M., Ennis, M., Koopmans, J., Vincent, L., Guther, H., . . . Hunter, J. (2001). The effect of group psychosocial support on survival in metastatic breast cancer. *New England Journal of Medicine, 345,* 1719–1726. doi:10.1056/NEJMoa011871

Gramignano, G., Lusso, M.R., Madeddu, C., Massa, E., Serpe, R., Deiana, L., . . . Mantovani, G. (2006). Efficacy of l-carnitine administration on fatigue, nutritional status, oxidative stress, and related quality of life in 12 advanced cancer patients undergoing anticancer therapy. *Nutrition, 22,* 136–145. doi:10.1016/j.nut.2005.06.003

Grant, M.D., Piper, M., Bohlius, J., Tonia, T., Robert, N., Vats, V., . . . Aronson, N. (2013). *Epoetin and darbepoetin for managing anemia in patients undergoing cancer treatment: Comparative effectiveness update*. Rockville, MD: Agency for Healthcare Research and Quality.

Graziano, F., Bisonni, R., Catalano, V., Silva, R., Rovidati, S., Mencarini, E., . . . Lai, V. (2002). Potential role of levocarnitine supplementation for the treatment of chemotherapy-induced fatigue in non-anaemic cancer patients. *British Journal of Cancer, 86,* 1854–1857. doi:10.1038/sj.bjc.6600413

Hadorn, D.C., Baker, D., Hodges, J.S., & Hicks, N. (1996). Rating the quality of evidence for clinical practice guidelines. *Journal of Clinical Epidemiology, 49,* 749–754.

Hammerschlag, R., Jain, S., Baldwin, A.L., Gronowicz, G., Lutgendorf, S.K., Oschman, J.L., & Yount, G.L. (2012). Biofield research: A roundtable discussion of scientific and methodological issues. *Journal of Alternative and Complementary Medicine, 18,* 1081–1086. doi:10.1089/acm.2012.1502

Hanssens, S., Luyten, R., Watthy, C., Fontaine, C., Decoster, L., Baillon, C., . . . De Grève, J. (2011). Evaluation of a comprehensive rehabilitation program for post-treatment patients with cancer [Online exclusive]. *Oncology Nursing Forum, 38,* E418–E424. doi:10.1188/11.ONF.e418-e424

Harder, H., Parlour, L., & Jenkins, V. (2012). Randomised controlled trials of yoga interventions for women with breast cancer: A systematic literature review. *Supportive Care in Cancer, 20,* 3055–3064. doi:10.1007/s00520-012-1611-8

Hawkes, A.L., Chambers, S.K., Pakenham, K.I., Patrao, T.A., Baade, P.D., Lynch, B.M., . . . Courneya, K.S. (2013). Effects of a telephone-delivered multiple health behavior change intervention (CanChange) on health and behavioral outcomes in survivors of colorectal cancer: A randomized controlled trial. *Journal of Clinical Oncology, 31,* 2313–2321. doi:10.1200/jco.2012.45.5873

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

He, X.R., Wang, Q., & Li, P.P. (2013). Acupuncture and moxibustion for cancer-related fatigue: A systematic review and meta-analysis. *Asian Pacific Journal of Cancer Prevention, 14,* 3067–3074.

Heim, M.E., v d Malsburg, M.L., & Niklas, A. (2007). Randomized controlled trial of a structured training program in breast cancer patients with tumor-related chronic fatigue. *Onkologie, 30,* 429–434. doi:10.1159/0000104097

Hoffman, C.J., Ersser, S.J., Hopkinson, J.B., Nicholls, P.G., Harrington, J.E., & Thomas, P.W. (2012). Effectiveness of mindfulness-based stress reduction in mood, breast- and endocrine-related quality of life, and well-being in stage 0 to III breast cancer: A randomized, controlled trial. *Journal of Clinical Oncology, 30,* 1335–1342. doi:10.1200/jco.2010.34.0331

Hovey, E., de Souza, P., Marx, G., Parente, P., Rapke, T., Hill, A., . . . Lloyd, A. (2014). Phase III, randomized, double-blind, placebo-controlled study of modafinil for fatigue in patients treated with docetaxel-based chemotherapy. *Supportive Care in Cancer, 22,* 1233–1242. doi:10.1007/s00520-013-2076-0

Howell, D., Oliver, T.K., Keller-Olaman, S., Davidson, J., Garland, S., Samuels, C., . . . Taylor, C. (2013). A Pan-Canadian practice guideline: Prevention, screening, assessment, and treatment of sleep disturbances in adults with cancer. *Supportive Care in Cancer, 21,* 2695–2705. doi:10.1007/s00520-013-1823-6

Humpel, N., & Iverson, D.C. (2010). Sleep quality, fatigue and physical activity following a cancer diagnosis. *European Journal of Cancer Care, 19,* 761–768. doi:10.1111/j.1365-2354.2009.01126.x

Institute of Medicine. (2013). *Delivering high-quality cancer care: Charting a new course for a system in crisis.* Washington, DC: National Academies Press.

Jacobsen, P.B., Donovan, K.A., Vadaparampil, S.T., & Small, B.J. (2007). Systematic review and meta-analysis of psychological and activity-based interventions for cancer-related fatigue. *Health Psychology, 26,* 660–667. doi:10.1037/0278-6133.26.6.660

Jain, S., & Mills, P.J. (2010). Biofield therapies: Helpful or full of hype? A best evidence synthesis. *International Journal of Behavioral Medicine, 17,* 1–16. doi:10.1007/s12529-009-9062-4

Jean-Pierre, P., Morrow, G.R., Roscoe, J.A., Heckler, C., Mohile, S., Janelsins, M., . . . Hopkins, J.O. (2010). A phase 3 randomized, placebo-controlled, double-blind, clinical trial of the effect of modafinil on cancer-related fatigue among 631 patients receiving chemotherapy: A University of Rochester Cancer Center Community Clinical Oncology Program Research base study. *Cancer, 116,* 3513–3520. doi:10.1002/cncr.25083

Jensen, B.T., Jensen, J.B., Laustsen, S., Petersen, A.K., Søndergaard, I., & Borre, M. (2014). Multidisciplinary rehabilitation can impact on health-related quality of life outcome in radical cystectomy: Secondary reported outcome of a randomized controlled trial. *Journal of Multidisciplinary Healthcare, 7,* 301–311. doi:10.2147/jmdh.s62172

Jensen, M.B., & Hessov, I. (1997). Randomization to nutritional intervention at home did not improve postoperative function, fatigue or well-being. *British Journal of Surgery, 84,* 113–118. doi:10.1046/j.1365-2168.1997.02457.x

Jeste, N., Liu, L., Rissling, M., Trofimenko, V., Natarajan, L., Parker, B.A., & Ancoli-Israel, S. (2013). Prevention of quality-of-life deterioration with light therapy is associated with changes in fatigue in women with breast cancer undergoing chemotherapy. *Quality of Life Research, 22,* 1239–1244. doi:10.1007/s11136-012-0243-2

Johnson, R.A., Meadows, R.L., Haubner, J.S., & Sevedge, K. (2008). Animal-assisted activity among patients with cancer: Effects on mood, fatigue, self-perceived health, and sense of coherence. *Oncology Nursing Forum, 35,* 225–232. doi:10.1188/08.ONF.225-232

Johnston, M.F., Hays, R.D., Subramanian, S.K., Elashoff, R.M., Axe, E.K., Li, J.J., . . . Hui, K.K. (2011). Patient education integrated with acupuncture for relief of cancer-related fatigue randomized controlled feasibility study. *BMC Complementary Alternative Medicine, 11,* 49. doi:10.1186/1472-6882-11-49

Kamath, J., Feinn, R., & Winokur, A. (2012). Thyrotropin-releasing hormone as a treatment for cancer-related fatigue: A randomized controlled study. *Supportive Care in Cancer, 20,* 1745–1753. doi:10.1007/s00520-011-1268-8

Kangas, M., Bovbjerg, D.H., & Montgomery, G.H. (2008). Cancer-related fatigue: A systematic and meta-analytic review of non-pharmacological therapies for cancer patients. *Psychological Bulletin, 134,* 700–741. doi:10.1037/a0012825

Karagozoglu, S., & Kahve, E. (2013). Effects of back massage on chemotherapy-related fatigue and anxiety: Supportive care and therapeutic touch in cancer nursing. *Applied Nursing Research, 26,* 210–217. doi:10.1016/j.apnr.2013.07.002

Keogh, J.W., & MacLeod, R.D. (2012). 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, 43,* 96–110. doi:10.1016/j.jpainsymman.2011.03.006

Kerr, C.W., Drake, J., Milch, R.A., Brazeau, D.A., Skretny, J.A., Brazeau, G.A., & Donnelly, J.P. (2012). Effects of methylphenidate on fatigue and depression: A randomized, double-blind, placebo-controlled trial. *Journal of Pain and Symptom Management, 43,* 68–77. doi:10.1016/j.jpainsymman.2011.03.026

Khiewkhern, S., Promthet, S., Sukprasert, A., Eunhpinitpong, W., & Bradshaw, P. (2013). Effectiveness of aromatherapy with light thai massage for cellular immunity improvement in colorectal cancer patients receiving chemotherapy. *Asian Pacific Journal of Cancer Prevention, 14,* 3903–3907.

Kiecolt-Glaser, J.K., Bennett, J.M., Andridge, R., Peng, J., Shapiro, C.L., Malarkey, W.B., . . . Glaser, R. (2014). Yoga's impact on inflammation, mood, and fatigue in breast cancer survivors: A randomized controlled trial. *Journal of Clinical Oncology, 32,* 1040–1049. doi:10.1200/jco.2013.51.8860

Kieviet-Stijnen, A., Visser, A., Garssen, B., & Hudig, W. (2008). Mindfulness-based stress reduction training for oncology patients: Patients' appraisal and changes in well-being. *Patient Education and Counseling, 72,* 436–442. doi:10.1016/j.pec.2008.05.015

Kim, S.D., & Kim, H.S. (2005). Effects of a relaxation breathing exercise on fatigue in haemopoietic stem cell transplantation patients. *Journal of Clinical Nursing, 14,* 51–55. doi:10.1111/j.1365-2702.2004.00938.x

Kim, Y., Roscoe, J.A., & Morrow, G.R. (2002). The effects of information and negative affect on severity of side effects from radiation therapy for prostate cancer. *Supportive Care in Cancer, 10,* 416–421. doi:10.1007/s00520-002-0359-y

Kim, Y.H., Kim, H.J., Ahn, S.D., Seo, Y.J., & Kim, S.H. (2013). Effects of meditation on anxiety, depression, fatigue, and quality of life of women undergoing radiation therapy for breast cancer. *Complementary Therapies in Medicine, 21,* 379–387. doi:10.1016/j.ctim.2013.06.005

King, A.C., Ahn, D.F., Atienza, A.A., & Kraemer, H.C. (2008). Exploring refinements in targeted behavioral medicine intervention to advance public health. *Annals of Behavioral Medicine, 35,* 251–260. doi:10.1007/s12160-008-9032-0

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

Kohara, H., Miyauchi, T., Suehiro, Y., Ueoka, H., Takeyama, H., & Morita, T. (2004). Combined modality treatment of aromatherapy, footsoak, and reflexology relieves fatigue in patients with cancer. *Journal of Palliative Medicine, 7,* 791–796. doi:10.1089/jpm.2004.7.791

Korstjens, I., Mesters, I., van der Peet, E., Gijsen, B., & van den Borne, B. (2006). Quality of life of cancer survivors after physical and psychosocial rehabilitation. *European Journal of Cancer Prevention, 15,* 541–547. doi:10.1097/01.cej.0000220625.77857.95

Kröz, M., Fink, M., Reif, M., Grobbecker, S., Zerm, R., Quetz, M., . . . Gutenbrunner, C. (2013). Multimodal therapy concept and aerobic training in breast cancer patients with chronic cancer-related fatigue. *Integrative Cancer Therapies, 12,* 301–311. doi:10.1177/1534735412464552

Kummer, F., Catuogno, S., Perseus, J.M., Bloch, W., & Baumann, F.T. (2013). Relationship between cancer-related fatigue and physical activity in inpatient cancer rehabilitation. *Anticancer Research, 33,* 3415–3422.

Kwekkeboom, K.L., Abbott-Anderson, K., Cherwin, C., Roiland, R., Serlin, R.C., & Ward, S.E. (2012). Pilot randomized controlled trial of a patient-controlled cognitive-behavioral intervention for the pain, fatigue, and sleep disturbance symptom cluster in cancer. *Journal of Pain and Symptom Management, 44,* 810–822. doi:10.1016/j.jpainsymman.2011.12.281

Kwekkeboom, K.L., Cherwin, C.H., Lee, J.W., & Wanta, B. (2010). Mind-body treatments for the pain-fatigue-sleep disturbance symptom cluster in persons with cancer. *Journal of Pain and Symptom Management, 39,* 128–138. doi:10.1016/j.jpainsymman.2009.05.022

Langston, B., Armes, J., Levy, A., Tidey, E., & Ream, E. (2013). The prevalence and severity of fatigue in men with prostate cancer: A systematic review of the literature. *Supportive Care in Cancer, 21,* 1761–1771. doi:10.1007/s00520-013-1751-5

Larkin, D., Lopez, V., & Aromataris, E. (2013). Managing cancer-related fatigue in men with prostate cancer: A systematic review of non-pharmacological interventions. *International Journal of Nursing Practice*. Advanced online publication. doi:10.1111/ijn.12211

Lee, H., Lim, Y., Yoo, M.S., & Kim, Y. (2011). Effects of a nurse-led cognitive-behavior therapy on fatigue and quality of life of patients with breast cancer undergoing radiotherapy: An exploratory study. *Cancer Nursing, 34,* E22–E30. doi:10.1097/NCC.0b013e31820d1734

Lee, S., Jerng, U.M., Liu, Y., Kang, J.W., Nam, D., & Lee, J.D. (2014). The effectiveness and safety of moxibustion for treating cancer-related fatigue: A systematic review and meta-analyses. *Supportive Care in Cancer, 22,* 1429–1440. doi:10.1007/s00520-014-2161-z

Lengacher, C.A., Johnson-Mallard, V., Post-White, J., Moscoso, M.S., Jacobsen, P.B., Klein, T.W., . . . Kip, K.E. (2009). Randomized controlled trial of mindfulness-based stress reduction (MBSR) for survivors of breast cancer. *Psycho-Oncology, 18,* 1261–1272. doi:10.1002/pon.1529

Lengacher, C.A., Reich, R.R., Post-White, J., Moscoso, M., Shelton, M.M., Barta, M., . . . Budhrani, P. (2012). Mindfulness based stress reduction in post-treatment breast cancer patients: An examination of symptoms and symptom clusters. *Journal of Behavioral Medicine, 35,* 86–94. doi:10.1007/s10865-011-9346-4

Lesser, G.J., Case, D., Stark, N., Williford, S., Giguere, J., Garino, L.A., . . . Shaw, E.G. (2013). A randomized, double-blind, placebo-controlled study of oral coenzyme Q10 to relieve self-reported treatment-related fatigue in newly diagnosed patients with breast cancer. *Journal of Supportive Oncology, 11,* 31–42. doi:10.1016/j.suponc.2012.03.003

Li, X.H., Zhu, J.L., Hong, C., Zeng, L., Deng, L.M., & Jin, L.Y. (2013). Effects of systematic rehabilitation programs on quality of life in patients undergoing lung resection. *Molecular and Clinical Oncology, 1,* 200–208. doi:10.3892/mco.2012.31

Lichtin, A.E. (2011). Clinical practice guidelines for the use of erythroid-stimulating agents: ASCO, EORTC, NCCN. *Cancer Treatment and Research, 157,* 239–248. doi:10.1007/978-1-4419-7073-2_14

Lindemalm, C., Strang, P., & Lekander, M. (2005). Support group for cancer patients. Does it improve their physical and psychological wellbeing? A pilot study. *Supportive Care in Cancer, 13,* 652–657.

Lohr, K.N. (2004). Rating the strength of scientific evidence: Relevance for quality improvement programs. *International Journal for Quality in Health Care, 16,* 9–18. doi:10.1093/intqhc/mzh005

Lower, E.E., Fleishman, S., Cooper, A., Zeldis, J., Faleck, H., Yu, Z., & Manning, D. (2009). Efficacy of dexmethylphenidate for the treatment of fatigue after cancer chemotherapy: A randomized clinical trial. *Journal of Pain and Symptom Management, 38,* 650-662. doi:10.1016/j.jpainsymman.2009.03.011

Lu, Q., Zheng, D., Young, L., Kagawa-Singer, M., & Loh, A. (2012). A pilot study of expressive writing intervention among Chinese-speaking breast cancer survivors. *Health Psychology, 31,* 548–551. doi:10.1037/a0026834

Lutgendorf, S.K., Mullen-Houser, E., Russell, D., Degeest, K., Jacobson, G., Hart, L., . . . Lubaroff, D.M. (2010). Preservation of immune function in cervical cancer patients during chemoradiation using a novel integrative approach. *Brain, Behavior, and Immunity, 24,* 1231–1240. doi:10.1016/j.bbi.2010.06.014

Lyon, D.E., Schubert, C., & Taylor, A.G. (2010). Pilot study of cranial stimulation for symptom management in breast cancer. *Oncology Nursing Forum, 37,* 476–483. doi:10.1188/10.ONF.476-483

Macciò, A., Madeddu, C., Gramignano, G., Mulas, C., Floris, C., Sanna, E., . . . Mantovani, G. (2012). A randomized phase III clinical trial of a combined treatment for cachexia in patients with gynecological cancers: Evaluating the impact on metabolic and inflammatory profiles and quality of life. *Gynecologic Oncology, 124,* 417–425. doi:10.1016/j.ygyno.2011.12.435

Mantovani, G. (2010). Randomised phase III clinical trial of 5 different arms of treatment on 332 patients with cancer cachexia. *European Review for Medical and Pharmacological Sciences, 14,* 292–301.

Mantovani, G., Maccio, A., Madeddu, C., Gramignano, G., Lusso, M.R., Serpe, R., . . . Deiana, L. (2006). A phase II study with antioxidants, both in the diet and supplemented, pharmaconutritional support, progestagen, and anti-cyclooxygenase-2 showing efficacy and safety in patients with cancer-related anorexia/cachexia and oxidative stress. *Cancer Epidemiology, Biomarkers and Prevention, 15,* 1030–1034. doi:10.1158/1055-9965.EPI-05-0538

Mantovani, G., Macciò, A., Madeddu, C., Gramignano, G., Serpe, R., Massa, E., . . . Floris, C. (2008). Randomized phase III clinical trial of five different arms of treatment for patients with cancer cachexia: Interim results. *Nutrition, 24*, 305–313.

Matsuo, N., & Yomiya, K. (2013). Aggravation of fatigue by steroid therapy in terminally ill patients with cancer. *American Journal of Hospice and Palliative Care, 31,* 341–344. doi:10.1177/1049909113485280

McMillan, E.M., & Newhouse, I.J. (2011). 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, 36,* 892–903. doi:10.1139/h11-082

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

Mehling, W.E., Lown, E.A., Dvorak, C.C., Cowan, M.J., Horn, B.N., Dunn, E.A., . . . Hecht, F.M. (2012). Hematopoietic cell transplant and use of massage for improved symptom management: Results from a pilot randomized control trial. *Evidence-Based Complementary and Alternative Medicine, 2012,* 450150. doi:10.1155/2012/450150

Milbury, K., Chaoul, A., Biegler, K., Wangyal, T., Spelman, A., Meyers, C.A., . . . Cohen, L. (2013). Tibetan sound meditation for cognitive dysfunction: Results of a randomized controlled pilot trial. *Psycho-Oncology*. Advanced online publication. doi:10.1002/pon.3296

Milbury, K., Spelman, A., Wood, C., Matin, S.F., Tannir, N., Jonasch, E., . . . Cohen, L. (2014). Randomized controlled trial of expressive writing for patients with renal cell carcinoma. *Journal of Clinical Oncology, 32,* 663–670. doi:10.1200/jco.2013.50.3532

Minton, O., Richardson, A., Sharpe, M., Hotopf, M., & Stone, P. (2008). A systematic review and meta-analysis of the pharmacological treatment of cancer-related fatigue. *Journal of the National Cancer Institute, 100,* 1155–1166. doi:10.1093/jnci/djn250

Minton, O., Richardson, A., Sharpe, M., Hotopf, M., & Stone, P. (2010). Drug therapy for the management of cancer-related fatigue. *Cochrane Database of Systematic Reviews, 7,* CD006704. doi:10.1002/14651858

Minton, O., Richardson, A., Sharpe, M., Hotopf, M., & Stone, P.C. (2011). Psychostimulants for the management of cancer-related fatigue: A systematic review and meta-analysis. *Journal of Pain and Symptom Management, 41,* 761–767. doi:10.1016/j.jpainsymman.2010.06.020

Mishra, S.I., Scherer, R.W., Geigle, P.M., Berlanstein, D.R., Topaloglu, O., Gotay, C.C., & Snyder, C. (2012). Exercise interventions on health-related quality of life for cancer survivors. *Cochrane Database of Systematic Reviews, 8,* CD007566. doi:10.1002/14651858.CD007566.pub2

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:10.1002/14651858.CD008465.pub2

Mitchell, S.A., & Beck, S.L. (2009). Fatigue. In J. Tipton and L. Eaton (Eds). *Putting Evidence Into Practice: Improving patient outcomes* (2nd ed., pp. 155–174). Pittsburgh, PA: Oncology Nursing Society.

Mitchell, S.A., Beck, S.L., Hood, L.E., Moore, K., & Tanner, E.R. (2007). Putting Evidence Into Practice: Evidence-based interventions for fatigue during and following cancer and its treatment. *Clinical Journal of Oncology Nursing, 11,* 99–113. doi:10.1188/07.CJON.99-113

Mitchell, S.A., & Friese, C.R. (2009). Decision rules for summative evaluation of a body of evidence. Retrieved from https://www.ons.org/practice-resources/pep/evaluation-process

Moadel, A.B., Shah, C., Wylie-Rosett, J., Harris, M.S., Patel, S.R., Hall, C.B., & Sparano, J.A. (2007). Randomized controlled trial of yoga among a multiethnic sample of breast cancer patients: Effects on quality of life. *Journal of Clinical Oncology, 25,* 4387–4395.

Molassiotis, A. (2013a). Evidence is in the eye of the beholder. *Supportive Care in Cancer, 21,* 3259–3260. doi:10.1007/s00520-013-1929-x

Molassiotis, A. (2013b). Managing cancer-related fatigue with acupuncture: Is it all good news for patients? *Acupuncture in Medicine, 31,* 3–4. doi:10.1136/acupmed-2012-010292

Molassiotis, A., Bardy, J., Finnegan-John, J., Mackereth, P., Ryder, D.W., Filshie, J., . . . Richardson, A. (2012). Acupuncture for cancer-related fatigue in patients with breast cancer: A pragmatic randomized controlled trial. *Journal of Clinical Oncology, 30,* 4470–4476. doi:10.1200/jco.2012.41.6222

Molassiotis, A., Bardy, J., Finnegan-John, J., Mackereth, P., Ryder, W.D., Filshie, J., . . . Richardson, A. (2013). A randomized, controlled trial of acupuncture self-needling as maintenance therapy for cancer-related fatigue after therapist-delivered acupuncture. *Annals of Oncology, 24,* 1645–1652. doi:10.1093/annonc/mdt034

Molassiotis, A., & Richardson, A. (2013). Reply to A. Azad et al. *Journal of Clinical Oncology, 31,* 2058–2059.

Mollaolu, M., & Erdoan, G. (2014). Effect on symptom control of structured information given to patients receiving chemotherapy. *European Journal of Oncology Nursing, 18,* 78–84. doi:10.1016/j.ejon.2013.07.006

Monk, J.P., Phillips, G., Waite, R., Kuhn, J., Schaaf, L.J., Otterson, G.A., . . . Villalona-Calero, M.A. (2006). Assessment of tumor necrosis factor alpha blockade as an intervention to improve tolerability of dose-intensive chemotherapy in cancer patients. *Journal of Clinical Oncology, 24,* 1852–1859.

Montgomery, G.H., Bovbjerg, D.H., Schnur, J.B., David, D., Goldfarb, A., Weltz, C.R., . . . Silverstein, J.H. (2007). A randomized clinical trial of a brief hypnosis intervention to control side effects in breast surgery patients. *Journal of the National Cancer Institute, 99,* 1304–1312. doi:10.1093/jnci/djm106

Montgomery, G.H., David, D., Kangas, M., Green, S., Sucala, M., Bovbjerg, D.H., . . . Schnur, J.B. (2014). Randomized controlled trial of a cognitive-behavioral therapy plus hypnosis intervention to control fatigue in patients undergoing radiotherapy for breast cancer. *Journal of Clinical Oncology, 32,* 557–563. doi:10.1200/jco.2013.49.3437

Montgomery, G.H., Kangas, M., David, D., Hallquist, M.N., Green, S., Bovbjerg, D.H., & Schnur, J.B. (2009). Fatigue during breast cancer radiotherapy: An initial randomized study of cognitive-behavioral therapy plus hypnosis. *Health Psychology, 28,* 317–322. doi:10.1037/a0013582

Moraska, A.R., Sood, A., Dakhil, S.R., Sloan, J.A., Barton, D., Atherton, P.J., . . . Loprinzi, C.L. (2010). Phase III, randomized, double-blind, placebo-controlled study of long-acting methylphenidate for cancer-related fatigue: North Central Cancer Treatment Group NCCTG-N05C7 trial. *Journal of Clinical Oncology, 28,* 3673–3679. doi:10.1200/jco.2010.28.1444

Morrow, G.R., Hickok, J.T., Roscoe, J.A., Raubertas, R.F., Andrews, P.L., Flynn, P.J., . . . King, D.K. (2003). Differential effects of paroxetine on fatigue and depression: A randomized, double-blind trial from the University of Rochester Cancer Center Community Clinical Oncology Program. *Journal of Clinical Oncology, 21,* 4635–4641. doi:10.1200/JCO.2003.04.070

Mosher, C.E., Duhamel, K.N., Lam, J., Dickler, M., Li, Y., Massie, M.J., & Norton, L. (2012). Randomised trial of expressive writing for distressed metastatic breast cancer patients. *Psychology and Health, 27,* 88–100. doi:10.1080/08870446.2010.551212

Moss, E.L., Simpson, J.S., Pelletier, G., & Forsyth, P. (2006). An open-label study of the effects of bupropion SR on fatigue, depression and quality of life of mixed-site cancer patients and their partners. *Psycho-Oncology, 15,* 259–267. doi:10.1002/pon.952

Mustian, K.M., Roscoe, J.A., Palesh, O.G., Sprod, L.K., Heckler, C.E., Peppone, L.J., . . . Morrow, G.R. (2011). Polarity therapy for cancer-related fatigue in patients with breast cancer receiving radiation therapy: A randomized controlled pilot study. *Integrative Cancer Therapies, 10,* 27–37. doi:10.1177/1534735410397044

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

Mustian, K.M., Sprod, L.K., Janelsins, M., Peppone, L.J., & Mohile, S. (2012). Exercise recommendations for cancer-related fatigue, cognitive impairment, sleep problems, depression, pain, anxiety, and physical dysfunction: A review. *Oncology and Hematology Review, 8,* 81–88.

Myers, C.D., Walton, T., Bratsman, L., Wilson, J., & Small, B. (2008). Massage modalities and symptoms reported by cancer patients: Narrative review. *Journal of the Society for Integrative Oncology, 6,* 19–28.

Nakau, M., Imanishi, J., Watanabe, S., Imanishi, A., Baba, T., Hirai, K., . . . Morimoto, Y. (2013). Spiritual care of cancer patients by integrated medicine in urban green space: A pilot study. *Explore, 9,* 87–90. doi:10.1016/j.explore.2012.12.002

National Comprehensive Cancer Network. (2014). Cancer-related fatigue [v.1.2014]. Retrieved from http://www.nccn.org/professionals/physician_gls/PDF/fatigue.pdf

Neefjes, E.C., van der Vorst, M.J., Blauwhoff-Buskermolen, S., & Verheul, H.M. (2013). Aiming for a better understanding and management of cancer-related fatigue. *Oncologist, 18,* 1135–1143. doi:10.1634/theoncologist.2013-0076

Neikrug, A.B., Rissling, M., Trofimenko, V., Liu, L., Natarajan, L., Lawton, S., . . . Ancoli-Israel, S. (2012). Bright light therapy protects women from circadian rhythm desynchronization during chemotherapy for breast cancer. *Behavioral Sleep Medicine, 10,* 202–216. doi:10.1080/15402002.2011.634940

Oh, B., Butow, P., Mullan, B., Clarke, S., Beale, P., Pavlakis, N., . . . Rosenthal, D. (2010). Impact of medical Qigong on quality of life, fatigue, mood and inflammation in cancer patients: A randomized controlled trial. *Annals of Oncology, 21,* 608–614. doi:10.1093/annonc/mdp479

O'Regan, D., & Filshie, J. (2010). Acupuncture and cancer. *Autonomic Neuroscience, 157,* 96–100.

Oyama, H., Kaneda, M., Katsumata, N., Akechi, T., & Ohsuga, M. (2000). Using the bedside wellness system during chemotherapy decreases fatigue and emesis in cancer patients. *Journal of Medical Systems, 24,* 173–182.

Oyama, H., Ohsuga, M., Tatsuno, Y., & Katsumata, H. (1999). Evaluation of the psycho-oncological effectiveness of the bedside wellness system. *Cyberpsychology and Behavior, 2,* 81–84. doi:10.1089/cpb.1999.2.81

Pan, Y.Q., Yang, K.H., Wang, Y.L., Zhang, L.P., & Liang, H.Q. (2013). Massage interventions and treatment-related side effects of breast cancer: A systematic review and meta-analysis. *International Journal of Clinical Oncology*. Advanced online publication. doi:10.1007/s10147-013-0635-5

Paramanandam, V.S., & Dunn, V. (2014). Exercise for the management of cancer-related fatigue in lung cancer: A systematic review. *European Journal of Cancer Care*. Advanced online publication. doi:10.1111/ecc.12198

Payne, C., Wiffen, P.J., & Martin, S. (2012). Interventions for fatigue and weight loss in adults with advanced progressive illness. *Cochrane Database of Systematic Reviews, 1,* CD008427. doi:10.1002/14651858.CD008427.pub2

Persoon, S., Kersten, M.J., van der Weiden, K., Buffart, L.M., Nollet, F., Brug, J., & Chinapaw, M.J. (2013). Effects of exercise in patients treated with stem cell transplantation for a hematologic malignancy: A systematic review and meta-analysis. *Cancer Treatment Reviews, 39,* 682–690. doi:10.1016/j.ctrv.2013.01.001

Peters, M.E., Goedendorp, M.M., Verhagen, C.A., van der Graaf, W.T., & Bleijenberg, G. (2013). Severe fatigue during the palliative treatment phase of cancer: An exploratory study. *Cancer Nursing, 37,* 139–145. doi:10.1097/NCC.0b013e318291bd2d

Peuckmann, V., Elsner, F., Krumm, N., Trottenberg, P., & Radbruch, L. (2010). Pharmacological treatments for fatigue associated with palliative care. *Cochrane Database of Systematic Reviews, 11,* CD006788. doi:10.1002/14651858.CD006788.pub2

Pinto, B.M., Papandonatos, G.D., Goldstein, M.G., Marcus, B.H., & Farrell, N. (2013). Home-based physical activity intervention for colorectal cancer survivors. *Psycho-Oncology, 22,* 54–64. doi:10.1002/pon.2047

Portela, M.A., Rubiales, A.S., & Centeno, C. (2011). The use of psychostimulants in cancer patients. *Current Opinion in Supportive and Palliative Care, 5,* 164–168. doi:10.1097/SPC.0b013e3283462ff3

Posadzki, P., Moon, T.W., Choi, T.Y., Park, T.Y., Lee, M.S., & Ernst, E. (2013). Acupuncture for cancer-related fatigue: A systematic review of randomized clinical trials. *Supportive Care in Cancer, 21,* 2067–2073. doi:10.1007/s00520-013-1765-z

Post-White, J., Kinney, M.E., Savik, K., Gau, J.B., Wilcox, C., & Lerner, I. (2003). Therapeutic massage and healing touch improve symptoms in cancer. *Integrative Cancer Therapies, 2,* 332–344.

Potthoff, K., Schmidt, M.E., Wiskemann, J., Hof, H., Klassen, O., Habermann, N., . . . Steindorf, K. (2013). Randomized controlled trial to evaluate the effects of progressive resistance training compared to progressive muscle relaxation in breast cancer patients undergoing adjuvant radiotherapy: The BEST study. *BMC Cancer, 13,* 162. doi:10.1186/1471-2407-13-162

Prinsen, H., Bleijenberg, G., Heijmen, L., Zwarts, M.J., Leer, J.W., Heerschap, A., . . . van Laarhoven, H.W. (2013). The role of physical activity and physical fitness in postcancer fatigue: A randomized controlled trial. *Supportive Care in Cancer, 21,* 2279–2288. doi:10.1007/s00520-013-1784-9

Puetz, T.W., & Herring, M.P. (2012). Differential effects of exercise on cancer-related fatigue during and following treatment: A meta-analysis. *American Journal of Preventive Medicine, 43,* E1–E24. doi:10.1016/j.amepre.2012.04.027

Purcell, A., Fleming, J., Burmeister, B., Bennett, S., & Haines, T. (2011). Is education an effective management strategy for reducing cancer-related fatigue? *Supportive Care in Cancer, 19,* 1429–1439. doi:10.1007/s00520-010-0970-2

Rabin, C., Pinto, B., Dunsiger, S., Nash, J., & Trask, P. (2009). Exercise and relaxation intervention for breast cancer survivors: Feasibility, acceptability and effects. *Psycho-Oncology, 18,* 258–266. doi:10.1002/pon.1341

Ream, E., Richardson, A., & Alexander-Dann, C. (2006). Supportive intervention for fatigue in patients undergoing chemotherapy: A randomized controlled trial. *Journal of Pain and Symptom Management, 31,* 148–161. doi:10.1016/j.jpainsymman.2005.07.003

Redd, W.H., Valdimarsdottir, H., Wu, L.M., Winkel, G., Byrne, E.E., Beltre, M.A., . . . Ancoli-Israel, S. (2014). Systematic light exposure in the treatment of cancer-related fatigue: A preliminary study. *Psycho-Oncology*. Advance online publication. doi:10.1002/pon.3553

Reich, R.R., Lengacher, C.A., Kip, K.E., Shivers, S.C., Schell, M.J., Shelton, M.M., . . . Klein, T.W. (2014). Baseline immune biomarkers as predictors of MBSR(BC) treatment success in off-treatment breast cancer patients. *Biological Research for Nursing, 16,* 429–437. doi:10.1177/1099800413519494

Reif, K., de Vries, U., Petermann, F., & Görres, S. (2013). A patient education program is effective in reducing cancer-related fatigue:

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

A multi-centre randomised two-group waiting-list controlled intervention trial. *European Journal of Oncology Nursing, 17,* 204–213. doi:10.1016/j.ejon.2012.07.002

Riesenberg, H., & Lübbe, A.S. (2010). In-patient rehabilitation of lung cancer patientsA prospective study. *Supportive Care in Cancer, 18,* 877–882. doi:10.1007/s00520-009-0727-y

Rissanen, R., Arving, C., Ahlgren, J., & Nordin, K. (2014). Group versus individual stress management intervention in breast cancer patients for fatigue and emotional reactivity: A randomised intervention study. *Acta Oncologica, 53,* 1–9.

Ritterband, L.M., Bailey, E.T., Thorndike, F.P., Lord, H.R., Farrell-Carnahan, L., & Baum, L.D. (2012). Initial evaluation of an Internet intervention to improve the sleep of cancer survivors with insomnia. *Psycho-Oncology, 21,* 695–705. doi:10.1002/pon.1969

Rizzo, J.D., Brouwers, M., Hurley, P., Seidenfeld, J., Arcasoy, M.O., Spivak, J.L., . . . Somerfield, M.R. (2010). American Society of Clinical Oncology/American Society of Hematology clinical practice guideline update on the use of epoetin and darbepoetin in adult patients with cancer. *Journal of Clinical Oncology, 28,* 4996–5010. doi:10.1200/jco.2010.29.2201

Roscoe, J.A., Matteson, S.E., Mustian, K.M., Padmanaban, D., & Morrow, G.R. (2005). Treatment of radiotherapy-induced fatigue through a nonpharmacological approach. *Integrative Cancer Therapies, 4,* 8–13. doi:10.1177/1534735404273726

Roscoe, J.A., Morrow, G.R., Hickok, J.T., Mustian, K.M., Griggs, J.J., Matteson, S.E., . . . Smith, B. (2005). Effect of paroxetine hydrochloride (Paxil) on fatigue and depression in breast cancer patients receiving chemotherapy. *Breast Cancer Research and Treatment, 89,* 243–249. doi:10.1007/s10549-004-2175-1

Roth, A.J., Nelson, C., Rosenfeld, B., Scher, H., Slovin, S., Morris, M., . . . Breitbart, W. (2010). Methylphenidate for fatigue in ambulatory men with prostate cancer. *Cancer, 116,* 5102–5110. doi:10.1002/cncr.25424

Ruddy, K.J., Barton, D., & Loprinzi, C.L. (2014). Laying to rest psychostimulants for cancer-related fatigue? *Journal of Clinical Oncology, 32,* 1865–1867. doi:10.1200/jco.2014.55.8353

Sadja, J., & Mills, P.J. (2013). Effects of yoga interventions on fatigue in cancer patients and survivors: A systematic review of randomized controlled trials. *Explore, 9,* 232–243.

Savard, J., Simard, S., Giguère, I., Ivers, H., Morin, C.M., Maunsell, E., . . . Marceau, D. (2006). Randomized clinical trial on cognitive therapy for depression in women with metastatic breast cancer: Psychological and immunological effects. *Palliative and Supportive Care, 4,* 219–237.

Schjolberg, T.K., Dodd, M., Henriksen, N., Asplund, K., Cvancarova Småstuen, M., & Rustoen, T. (2014). Effects of an educational intervention for managing fatigue in women with early stage breast cancer. *European Journal of Oncology Nursing, 18,* 286–294. doi:10.1016/j.ejon.2014.01.008

Schmidt, M.E., Wiskemann, J., Krakowski-Roosen, H., Knicker, A.J., Habermann, N., Schneeweiss, A., . . . Steindorf, K. (2013). Progressive resistance versus relaxation training for breast cancer patients during adjuvant chemotherapy: Design and rationale of a randomized controlled trial (BEATE study). *Contemporary Clinical Trials, 34,* 117–125. doi:10.1016/j.cct.2012.10.006

Schneider, S.M., Ellis, M., Coombs, W.T., Shonkwiler, E.L., & Folsom, L.C. (2003). Virtual reality intervention for older women with breast cancer. *Cyberpsychology and Behavior, 6,* 301–307.

Schneider, S.M., & Hood, L.E. (2007). Virtual reality: A distraction intervention for chemotherapy. *Oncology Nursing Forum, 34,* 39–46. doi:10.1188/07.ONF.39-46

Schneider, S.M., Prince-Paul, M., Allen, M.J., Silverman, P., & Talaba, D. (2004). Virtual reality as a distraction intervention for women receiving chemotherapy. *Oncology Nursing Forum, 31,* 81–88. doi:10.1188/04.ONF.81-88

Schumacher, K., Schneider, B., Reich, G., Stiefel, T., Stoll, G., Bock, P.R., . . . Beuth, J. (2003). Influence of postoperative complementary treatment with lectin-standardized mistletoe extract on breast cancer patients. A controlled epidemiological multicentric retrolective cohort study. *Anticancer Research, 23,* 5081–5087.

Scott, D.A., Mills, M., Black, A., Cantwell, M., Campbell, A., Cardwell, C.R., . . . Donnelly, M. (2013). Multidimensional rehabilitation programmes for adult cancer survivors. *Cochrane Database of Systematic Reviews, 3,* CD007730. doi:10.1002/14651858.CD007730.pub2

Shaw, E.G., Rosdhal, R., D'Agostino, R.B., Jr., Lovato, J., Naughton, M.J., Robbins, M.E., & Rapp, S.R. (2006). Phase II study of donepezil in irradiated brain tumor patients: Effect on cognitive function, mood, and quality of life. *Journal of Clinical Oncology, 24,* 1415–1420. doi:10.1200/JCO.2005.03.3001

Shneerson, C., Taskila, T., Gale, N., Greenfield, S., & Chen, Y.F. (2013). The effect of complementary and alternative medicine on the quality of life of cancer survivors: A systematic review and meta-analyses. *Complementary Therapies in Medicine, 21,* 417–429. doi:10.1016/j.ctim.2013.05.003

Sikorskii, A., Given, C.W., Siddiqi, A.E., Champion, V., McCorkle, R., Spoelstra, S.L., & Given, B.A. (2014). Testing the differential effects of symptom management interventions in cancer. *Psycho-Oncology.* Advance online publication. doi:10.1002/pon.3555

Smith, C., Carmady, B., Thornton, C., Perz, J., & Ussher, J.M. (2013). The effect of acupuncture on post-cancer fatigue and well-being for women recovering from breast cancer: A pilot randomised controlled trial. *Acupuncture in Medicine, 31,* 9–15. doi:10.1136/acupmed-2012-010228

Spahn, G., Choi, K.E., Kennemann, C., Lüdtke, R., Franken, U., Langhorst, J., . . . Dobos, G.J. (2013). Can a multimodal mind-body program enhance the treatment effects of physical activity in breast cancer survivors with chronic tumor-associated fatigue? A randomized controlled trial. *Integrative Cancer Therapies, 12,* 291–300. doi:10.1177/1534735413492727

Spathis, A., Dhillan, R., Booden, D., Forbes, K., Vrotsou, K., & Fife, K. (2009). Modafinil for the treatment of fatigue in lung cancer: A pilot study. *Palliative Medicine, 23,* 325–331. doi:10.1177/0269216309102614

Spathis, A., Fife, K., Blackhall, F., Dutton, S., Bahadori, R., Wharton, R., . . . Wee, B. (2014). Modafinil for the treatment of fatigue in lung cancer: Results of a placebo-controlled, double-blind, randomized trial. *Journal of Clinical Oncology, 32,* 1882–1888. doi:10.1200/jco.2013.54.4346

Speca, M., Carlson, L.E., Goodey, E., & Angen, M. (2000). A randomized, wait-list controlled clinical trial: The effect of a mindfulness meditation-based stress reduction program on mood and symptoms of stress in cancer outpatients. *Psychosomatic Medicine, 62,* 613–622.

Speck, R.M., Courneya, K.S., Mâsse, L.C., Duval, S., & Schmitz, K.H. (2010). An update of controlled physical activity trials in cancer survivors: A systematic review and meta-analysis. *Journal of Cancer Survivorship, 4,* 87–100. doi:10.1007/s11764-009-0110-5

Stan, D.L., Collins, N.M., Olsen, M.M., Croghan, I., & Pruthi, S. (2012). The evolution of mindfulness-based physical interventions in breast cancer survivors. *Evidence-Based Complementary and Alternative Medicine, 2012*, 758641. doi:10.1155/2012/758641

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

Stockler, M.R., O'Connell, R., Nowak, A.K., Goldstein, D., Turner, J., Wilcken, N.R., . . . Simes, R.J. (2007). Effect of sertraline on symptoms and survival in patients with advanced cancer, but without major depression: A placebo-controlled double-blind randomised trial. *Lancet Oncology, 8,* 603–612. doi:10.1016/S1470-2045(07)70148-1

Strasser, B., Steindorf, K., Wiskemann, J., & Ulrich, C.M. (2013). Impact of resistance training in cancer survivors: A meta-analysis. *Medicine and Science in Sports and Exercise, 45,* 2080–2090. doi:10.1249/MSS.0b013e31829a3b63

Strauss-Blasche, G., Gnad, E., Ekmekcioglu, C., Hladschik, B., & Marktl, W. (2005). Combined inpatient rehabilitation and spa therapy for breast cancer patients: Effects on quality of life and CA 15-3. *Cancer Nursing, 28,* 390–398.

Strong, V., Waters, R., Hibberd, C., Murray, G., Wall, L., Walker, J., . . . Sharpe, M. (2008). Management of depression for people with cancer (SMaRT oncology 1): A randomised trial. *Lancet, 372,* 40–48. doi:10.1016/S0140-6736(08)60991-5

Sturm, I., Baak, J., Storek, B., Traore, A., & Thuss-Patience, P. (2014). Effect of dance on cancer-related fatigue and quality of life. *Supportive Care in Cancer, 22,* 2241–2249.

Su, C.X., Wang, L.Q., Grant, S.J., & Liu, J.P. (2014). Chinese herbal medicine for cancer-related fatigue: A systematic review of randomized clinical trials. *Complementary Therapies in Medicine, 22,* 567–579. doi:10.1016/j.ctim.2014.04.007

Swenson, K.K., Nissen, M.J., Knippenberg, K., Sistermans, A., Spilde, P., Bell, E.M., . . . Tsai, M.L. (2014). Cancer rehabilitation: Outcome evaluation of a strengthening and conditioning program. *Cancer Nursing, 37,* 162–169. doi:10.1097/NCC.0b013e318288d429

Tomlinson, D., Diorio, C., Beyene, J., & Sung, L. (2014). Effect of exercise on cancer-related fatigue: A meta-analysis. *American Journal of Physical Medicine and Rehabilitation, 93,* 675–686. doi:10.1097/phm.0000000000000083

Tonia, T., & Bohlius, J. (2011). Ten years of meta-analyses on erythropoiesis-stimulating agents in cancer patients. *Cancer Treatment and Research, 157,* 217–238. doi:10.1007/978-1-4419-7073-2_13

Tonia, T., Mettler, A., Robert, N., Schwarzer, G., Seidenfeld, J., Weingart, O., . . . Bohlius, J. (2012). Erythropoietin or darbepoetin for patients with cancer. *Cochrane Database of Systematic Reviews, 12,* CD003407. doi:10.1002/14651858.CD003407.pub5

Tonia, T., Schwarzer, G., & Bohlius, J. (2013). Cancer, meta-analysis and reporting biases: The case of erythropoiesis-stimulating agents. *Swiss Medical Weekly, 143,* w13776.

Tookman, A.J., Jones, C.L., DeWitte, M., & Lodge, P.J. (2008). Fatigue in patients with advanced cancer: A pilot study of an intervention with infliximab. *Supportive Care in Cancer, 16,* 1131–1140. doi:10.1007/s00520-008-0429-x

Towler, P., Molassiotis, A., & Brearley, S.G. (2013). What is the evidence for the use of acupuncture as an intervention for symptom management in cancer supportive and palliative care: An integrative overview of reviews. *Supportive Care in Cancer, 21,* 2913–2923. doi:10.1007/s00520-013-1882-8

Tsai, H.F., Chen, Y.R., Chung, M.H., Liao, Y.M., Chi, M.J., Chang, C.C., & Chou, K.R. (2014). Effectiveness of music intervention in ameliorating cancer patients' anxiety, depression, pain, and fatigue: A meta-analysis. *Cancer Nursing.* Advance online publication. doi:10.1097/ncc.0000000000000116

Tsang, K.L., Carlson, L.E., & Olson, K. (2007). Pilot crossover trial of Reiki versus rest for treating cancer-related fatigue. *Integrative Cancer Therapies, 6,* 25–35. doi:10.1007/s00520-013-1882-8

U.S. Food and Drug Administration. (2013). FDA drug safety communication: Erythropoiesis-stimulating agents (ESAs)—Procrit, Epogen and Aranesp. Retrieved from http://www.fda.gov/Drugs/DrugSafety/PostmarketDrugSafetyInformationforPatientsandProviders/ucm109375.htm

van den Berg, M., Visser, A., Schoolmeesters, A., Edelman, P., & van den Borne, B. (2006). Evaluation of haptotherapy for patients with cancer treated with chemotherapy at a day clinic. *Patient Education and Counseling, 60,* 336–343. doi:10.1016/j.pec.2005.10.012

van der Lee, M.L., & Garssen, B. (2012). Mindfulness-based cognitive therapy reduces chronic cancer-related fatigue: A treatment study. *Psycho-Oncology, 21,* 264–272. doi:10.1002/pon.1890

van Haren, I.E., Timmerman, H., Potting, C.M., Blijlevens, N.M., Staal, J.B., & Nijhuis-van der Sanden, M.W. (2013). Physical exercise for patients undergoing hematopoietic stem cell transplantation: Systematic review and meta-analyses of randomized controlled trials. *Physical Therapy, 93,* 514–528. doi:10.2522/ptj.20120181

Van Lancker, A., Velghe, A., Van Hecke, A., Verbrugghe, M., Van Den Noortgate, N., Grypdonck, M., . . . Beeckman, D. (2014). Prevalence of symptoms in older cancer patients receiving palliative care: A systematic review and meta-analysis. *Journal of Pain and Symptom Management, 47,* 90–104. doi:10.1016/j.jpainsymman.2013.02.016

van Weert, E., Hoekstra-Weebers, J., Otter, R., Postema, K., Sanderman, R., & van der Schans, C. (2006). Cancer-related fatigue: Predictors and effects of rehabilitation. *Oncologist, 11,* 184–196. doi:10.1634/theoncologist.11-2-184

van Weert, E., May, A.M., Korstjens, I., Post, W.J., van der Schans, C.P., van den Borne, B., . . . Hoekstra-Weebers, J. E. (2010). Cancer-related fatigue and rehabilitation: A randomized controlled multicenter trial comparing physical training combined with cognitive-behavioral therapy with physical training only and with no intervention. *Physical Therapy, 90,* 1413–1425. doi:10.2522/ptj.20090212

Vargas, S., Antoni, M.H., Carver, C.S., Lechner, S.C., Wohlgemuth, W., Llabre, M., . . . Derhagopian, R.P. (2013). Sleep quality and fatigue after a stress management intervention for women with early-stage breast cancer in Southern Florida. *International Journal of Behavioral Medicine.* Advance online publication. doi:10.1007/s12529-013-9374-2

Velthuis, M.J., Agasi-Idenburg, S.C., Aufdemkampe, G., & Wittink, H.M. (2010). The effect of physical exercise on cancer-related fatigue during cancer treatment: A meta-analysis of randomised controlled trials. *Clinical Oncology, 22,* 208–221. doi:10.1016/j.clon.2009.12.005

Vilela, L.D., Nicolau, B., Mahmud, S., Edgar, L., Hier, M., Black, M., . . . Allison, P.J. (2006). Comparison of psychosocial outcomes in head and neck cancer patients receiving a coping strategies intervention and control subjects receiving no intervention. *Journal of Otolaryngology, 35,* 88–96.

Visser, A., Schoolmeesters, A., van den Berg, M., Schell, N., de Gelder, R., & van den Borne, B. (2011). Methodological reflections on body-mind intervention studies with cancer patients. *Patient Education and Counseling, 82,* 325–334. doi:10.1016/j.pec.2010.12.003

Wangnum, K., Thanarojanawanich, T., Chinwatanachai, K., Jamprasert, L., Maleehuan, O., & Janthakun, V. (2013). Impact of the multidisciplinary education program in self-care on fatigue in lung cancer patients receiving chemotherapy. *Journal of the Medical Association of Thailand, 96,* 1601–1608.

Wauters, I., & Vansteenkiste, J. (2012). Darbepoetin alfa in the treatment of anemia in cancer patients undergoing chemotherapy.

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.

Expert Review of Anticancer Therapy, 12, 1383–1390. doi:10.1586/era.12.117

Weis, J. (2011). Cancer-related fatigue: Prevalence, assessment and treatment strategies. *Expert Review of Pharmacoeconomics and Outcomes Research, 11,* 441–446. doi:10.1586/erp.11.44

Weitzner, M.A., Moncello, J., Jacobsen, P.B., & Minton, S. (2002). A pilot trial of paroxetine for the treatment of hot flashes and associated symptoms in women with breast cancer. *Journal of Pain and Symptom Management, 23,* 337–345.

Windsor, P.M., Potter, J., McAdam, K., & McCowan, C. (2009). Evaluation of a fatigue initiative: Information on exercise for patients receiving cancer treatment. *Clinical Oncology, 21,* 473–482. doi:10.1016/j.clon.2009.01.009

Wolin, K.Y., Ruiz, J.R., Tuchman, H., & Lucia, A. (2010). Exercise in adult and pediatric hematological cancer survivors: An intervention review. *Leukemia, 24,* 1113–1120. doi:10.1038/leu.2010.54

Wolin, K.Y., Schwartz, A.L., Matthews, C.E., Courneya, K.S., & Schmitz, K.H. (2012). Implementing the exercise guidelines for cancer survivors. *Journal of Supportive Oncology, 10,* 171–177. doi:10.1016/j.suponc.2012.02.001

Wright, F., Hammer, M.J., & Melkus, G.D. (2014). Associations between multiple chronic conditions and cancer-related fatigue: An integrative review. *Oncology Nursing Forum, 41,* 399–410. doi:10.1188/14.ONF.41-04AP

Yamane, H., Ochi, N., Yamagishi, T., & Takigawa, N. (2014). Guidelines for long-term steroid therapy in end-of-life palliative care. *Journal of Clinical Oncology, 32,* 607–608. doi:10.1200/jco.2013.53.2226

Yates, P., Aranda, S., Hargraves, M., Mirolo, B., Clavarino, A., McLachlan, S., & Skerman, H. (2005). Randomized controlled trial of an educational intervention for managing fatigue in women receiving adjuvant chemotherapy for early-stage breast cancer. *Journal of Clinical Oncology, 23,* 6027–6036. doi:10.1200/JCO.2005.01.271

Yennurajalingam, S., & Bruera, E. (2014). Reply to H. Yamane et al and M. Franco et al. *Journal of Clinical Oncology, 32,* 609. doi:10.1200/jco.2013.53.8710

Yennurajalingam, S., Frisbee-Hume, S., Palmer, J.L., Delgado-Guay, M.O., Bull, J., Phan, A.T., . . . Bruera, E. (2013). Reduction of cancer-related fatigue with dexamethasone: A double-blind, randomized, placebo-controlled trial in patients with advanced cancer. *Journal of Clinical Oncology, 31,* 3076–3082. doi:10.1200/jco.2012.44.4661

Yennurajalingam, S., Urbauer, D.L., Casper, K.L., Reyes-Gibby, C.C., Chacko, R., Poulter, V., & Bruera, E. (2010). Impact of a palliative care consultation team on cancer-related symptoms in advanced cancer patients referred to an outpatient supportive care clinic. *Journal of Pain and Symptom Management.* Advance online publication. doi:10.1016/j.jpainsymman.2010.03.017

Yeom, C.H., Jung, G.C., & Song, K.J. (2007). Changes of terminal cancer patients' health-related quality of life after high dose vitamin C administration. *Journal of Korean Medical Science, 22,* 7–11.

Yesilbalkan, O.U., Karadakovan, A., & Göker, E. (2009). The effectiveness of nursing education as an intervention to decrease fatigue in Turkish patients receiving chemotherapy [Online exclusive]. *Oncology Nursing Forum, 36,* E215–E222.

Yun, Y.H., Lee, K.S., Kim, Y.W., Park, S.Y., Lee, E.S., Noh, D.Y., . . . Park, S. (2012). Web-based tailored education program for disease-free cancer survivors with cancer-related fatigue: A randomized controlled trial. *Journal of Clinical Oncology, 30,* 1296–1303. doi:10.1200/jco.2011.37.2979

Zee, P.C., & Ancoli-Israel, S. (2009). Does effective management of sleep disorders reduce cancer-related fatigue? *Drugs, 69*(Suppl. 2), 29–41. doi:10.2165/11531140-000000000-00000

Zeng, Y., Luo, T., Xie, H., Huang, M., & Cheng, A.S. (2014). Health benefits of qigong or tai chi for cancer patients: A systematic review and meta-analyses. *Complementary Therapies in Medicine, 22,* 173–186. doi:10.1016/j.ctim.2013.11.010

Zhang, J., Yang, K.H., Tian, J.H., & Wang, C.M. (2012). 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 and Complementary Medicine, 18,* 994–1002. doi:10.1089/acm.2011.0514

Zick, S.M., Sen, A., Feng, Y., Green, J., Olatunde, S., & Boon, H. (2006). Trial of essiac to ascertain its effect in women with breast cancer (TEA-BC). *Journal of Alternative and Complementary Medicine, 12,* 971–980.

Zou, L.Y., Yang, L., He, X.L., Sun, M., & Xu, J.J. (2014). Effects of aerobic exercise on cancer-related fatigue in breast cancer patients receiving chemotherapy: A meta-analysis. *Tumour Biology, 35,* 5659–5667. doi:10.1007/s13277-014-1749-8

Downloaded on 01-11-2025. Single-user license only. Copyright 2025 by the Oncology Nursing Society. For permission to post online, reprint, adapt, or reuse, please email pubpermissions@ons.org. ONS reserves all rights.