


A Model of an Integrative Approach to Breast Cancer Patients

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Abstract

Background: Breast cancer (BC) survivors have physical and psychological needs that require convincing responses by health care providers. The quality of life issue and clinical unmet needs are among the main reasons pushing a number of patients toward “natural” therapies that are often misleading and alternative to mainstream cancer care. Integrative Oncology (IO) tries to respond to many of those needs, by combining lifestyle counseling, body-mind activities, and complementary evidence-informed therapies with anticancer standard treatments. **Methods:** In our model at Fondazione Policlinico Gemelli (FPG), every woman diagnosed with a BC waiting for surgery or candidate to neoadjuvant chemotherapy undergoes a preliminary psycho-oncological distress evaluation and a brief lifestyle interview. Anthropometric measurements, body composition analysis, and individual levels of physical activity are recorded. Patients are given evidence based recommendations about the advisable diet and physical activity in a prehabilitation setting. A physician provides patients with information about integrative care plans to treat symptoms related to the disease or its treatments. Therapeutic approaches include acupuncture, mindfulness-based protocols, qigong, massage therapy, and classes of music/art therapy. **Results:** Between September 2018 and February 2020, the Center for Integrative Oncology at FPG has carried out 1249 lifestyle counseling sessions, 1780 acupuncture treatments, 1340 physiotherapy sessions, 3261 psycho-oncological consultations, 218 herbal medicine counseling sessions. Moreover, 90 BC patients completed the mindfulness based stress reduction (MBSR) protocol and 970 patients participated in qigong, art therapy, and music therapy classes. **Conclusions:** Our integrative approach aims to achieve a person-centered medicine by improving symptoms management, adherence to oncological protocols, and eventually overall quality of life.

Keywords

integrative oncology, breast cancer, personalized medicine, lifestyles, unmet needs

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Background

Survival rates for Breast Cancer (BC) are generally rising worldwide, probably due to earlier diagnoses and improvements in treatment protocols, reaching 91% at 5 years and 80% 15 years after the diagnosis.¹ The prolonged survival, even in young and fertile women facing several side effects and symptoms, during and after cancer treatments, emphasizes the importance of quality of life in BC survivors.^{2,3}

The physical and psychological burden of those symptoms (pain, lymphedema, hair loss, constipation and diarrhea, hot flashes, vaginal dryness, neuropathy, sleep disturbances, and fatigue) may negatively impact on adherence to anticancer treatments.⁴ Moreover, BC patients are at risk of late side effects, such as cardiac toxicity, osteoporosis, weight gain, metabolic syndrome linked to obesity, and

sarcopenia,⁵⁻⁹ which worsen prognosis among BC survivors.^{10,11}

Unfortunately, some of these side effects are not completely assessed and properly met during the routine management of BC patients and survivors. These unmet needs are among the main reasons why patients seek complementary approaches, often from non-medical sources (internet, friends, and relatives) and may choose “alternative” practitioners, with potential risks for their health.^{12,13}

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Worldwide, an estimated 33% to 47% of cancer patients use complementary, alternative or integrative medicine during their therapeutic process, while more than 80% of BC survivors reported using integrative therapies during and beyond cancer treatments.¹⁴⁻²⁰

Integrative oncology (IO) is a “patient-centered, evidence-informed field of cancer care that utilizes mind and body practices, natural products, and/or lifestyle modifications from different traditions alongside conventional cancer treatments. Integrative oncology aims to optimize health, quality of life, clinical outcomes across the cancer continuum, and to empower people to prevent cancer and become active participants before, during, and beyond cancer treatment.”²¹

A growing number of randomized controlled trials suggest that selected integrative therapies may improve the management of symptoms and side effects as a result of BC and its treatment.²² In 2018, the American Society of Clinical Oncology (ASCO) endorsed the clinical guidelines released by the Society for Integrative Oncology (SIO) for BC patients.²³

Despite the widespread use of integrative treatments among BC patients and the available evidence about their safety and efficacy, facilities, and services providing those treatments inside the clinical cancer centers are not widely available around the world and particularly in Europe, even though their numbers are increasing.²⁴

The Breast Unit at Fondazione Policlinico Gemelli (FPG) in Rome is the leading Unit in Central-Southern Italy, with over 1000 new BC cases treated per year. Since 2014, thanks to the support of a no-profit organization (Komen Italia), an IO service within the Breast Unit has provided BC patients with psycho-oncological support, lifestyle counseling, and integrative treatments (Figure 1). After 5 years of clinical activities, at the end of 2019 a Center for Integrative Oncology was founded as a model of a holistic approach to every woman diagnosed with a BC.

The first step of this model is a comprehensive assessment that every BC patient waiting for surgery or neoadjuvant chemotherapy undergoes a few days after diagnosis: a preliminary psycho-oncological evaluation of the distress performed by a psycho-oncologist and a brief lifestyle interview. In addition, anthropometric parameters and body composition values are recorded by a trained dietitian focused on oncology. The aim is to identify physical and psychological critical issues that may affect patient’s compliance to treatments and intervene with specific prehabilitation programs, in order to reduce treatment-related side effects and improve outcomes.²⁵

After this preliminary assessment, during the preoperative period (a 4-6 weeks window of opportunity), psychological support, acupuncture, plantar reflexology, and/or qigong seminars may be proposed, depending on the distress codes, anxiety, sleep, and mood disturbances recorded

(Figure 2). Our team is composed of 4 trained dietitians, 2 psycho-oncologists, 3 physicians trained in acupuncture and traditional Chinese medicine, a mindfulness teacher, 2 breast nurses trained in shiatsu and reflexology, a physiotherapist, a qigong teacher, and a music-therapist.

The model is based on a personalized prescription given by a physician trained in IO rather than on demand by the patient; in other terms, every complementary procedure must be prescribed, based on evidence of efficacy and safety, according to woman’s symptoms, concomitant therapies, and preferences.

Methods

Lifestyle counseling

Physical activity (PA), nutrition, body composition, and metabolism play a key role in almost every aspect of cancer onset, progression, and management.^{26,27} Unfortunately, an appropriate nutritional and PA screening is not widely available in the routine management of BC patients, even in high quality Breast Units.²⁸⁻³⁰

In our model, every patient waiting for surgery or candidate to chemotherapy undergoes a brief lifestyle interview, called SIVO (integrative questionnaire of holistic evaluation), focusing on 5 areas (nutrition, physical activity, social relations, sexuality, and spirituality). Individual levels of PA are recorded through the International Physical Activity Questionnaires (IPAQ), while risk for malnutrition is investigated through a specific 6-item Mini Nutritional Assessment questionnaire (MNA[®]).

Anthropometric measurements include body weight, height, body mass index (BMI), body circumference (waist, hip), and waist to hip ratio (WHR), while body composition analysis is measured by the Segmental Multi-Frequency-Bioelectrical Impedance Analysis (SMF-BIA), a non-invasive and widely used method for estimating body fat (FAT) and fat-free body mass (FFM), phase angle (PA), and total body water (TBW).

Every patient receives recommendations about diet and PA based on the latest scientific evidence,^{26,31} while patients who are candidates for chemotherapy are given additional nutritional advice to manage chemo-related side effects.^{31,32} Patients with important comorbidities, such as heart disease, diabetes mellitus, and gastrointestinal resections may be referred to a specialist for a second level nutritional counseling. The lifestyle counseling sessions are performed by trained dietitians, expert in oncology.

Breast school

A few days after surgery, BC patients are referred to a physiotherapist and may take part to dedicated classes (*Breast School*), in order to expedite recovery and prevent

functional limitations, local pain, and lymphedema of the shoulder and upper arm.

The conditions to participate in *Breast School* classes are (a) having undergone a surgical procedure on the axilla (sentinel lymph node biopsy, sampling, or radical lymphadenectomy), (b) without any reconstructive procedure (prosthesis and/or autologous tissues). The rehabilitation program, based on active and passive shoulder movements, includes 10 sessions, twice a week, or less, according to the individual needs assessed by the physiotherapist.

Complementary therapies

In our Breast Unit at FPG, the integrative oncology (IO) interviews performed by a physician trained in integrative medicine have become part of the standard care for all BC patients. During this consultation, a specialist evaluates the patient's lifestyle, smoking/alcohol consumption, use of natural products (such as herbs and dietary supplements),²² sleep hygiene, side effects, and symptoms, in order to suggest non-pharmacological interventions, according to their needs, health status, and preferences. If necessary, the IO specialist refers the patient to other counselors (Figure 2).

According to the SIO guidelines, therapeutic approaches include acupuncture, mindfulness-based protocols, qigong, massage therapy, and classes of music/art therapy.

Acupuncture is a cost-effective and safe procedure for symptoms management, particularly when conventional treatments are ineffective or burdened by notable side effects. The National Comprehensive Cancer Network (NCCN) Guidelines recommend acupuncture for pain, fatigue, nausea/vomiting, and hot flashes.³³⁻³⁶

As regards chemotherapy-induced peripheral neuropathy (CIPN), a challenging symptom to manage in oncological patients,³⁷⁻⁴⁰ acupuncture may be considered in selected patients, according to the latest ESMO guidelines.⁴¹ Our Center for Integrative Oncology takes part in an ongoing multicenter clinical trial on Acupuncture for CIPN in BC patients.

Mindfulness-based stress reduction (MBSR) techniques, through the development of a nonjudgmental awareness of the present moment, have been shown to reduce distress, improve psychological well-being, and positively impact sleep quality and quantity in cancer patients.⁴²⁻⁴⁸ In randomized trials, MBSR techniques showed also benefits in decreasing fatigue, depression, anxiety, fear of cancer recurrence, and improved health related quality of life.⁴⁹⁻⁵³ In addition, evidence is emerging that mindfulness meditation is effective for chronic pain.⁵⁴

Over the last 20 years, mind-body therapies including qigong, yoga, tai-chi, and meditation have been taken into increasing consideration by the scientific community, thanks to an excellent profile of safety and efficacy.⁵⁵ At FPG, we offer qigong sessions in order to prevent or

alleviate common side effects and complications such as mood disorders, depression, fatigue,⁵⁶ and BC-related lymphedema.⁵⁷

Plantar reflexology, a safe and very well-accepted procedure, is used to mitigate pain, anxiety,⁵⁸ and sleep disorders that are poorly controlled by conventional pharmacological treatments.⁵⁹

Music therapy encompasses active (eg, singing, using percussive instruments, playing with sounds) and passive (eg, listening) techniques and it has shown benefits on anxiety, depression, pain, and cancer related fatigue in BC patients, either in descriptive and experimental studies.⁶⁰⁻⁶⁷

Art therapy, an intervention aimed to help patients and caregivers to cope with the disease and adapt to stressful experiences, has been used in a variety of clinical settings and populations, although few studies have been carried out in cancer patients; it could play a role in cancer patients who may be uncomfortable with conventional psychotherapy or those who find verbal expression difficult.^{68,69}

Results

In FPG, between September 2018 and February 2020, out of 1500 BC patients, 83% underwent a lifestyle counseling and 85% a psycho-oncological consultation before surgery or neoadjuvant chemotherapy. During the same period, 1780 acupuncture treatments, 1340 physiotherapy sessions, and 218 herbal medicine counseling sessions have been carried out. Moreover, 90 patients completed the MBSR protocol and 970 participated in qi gong, art therapy or music therapy classes.

Discussion

A remarkable number of studies have highlighted a significant correlation between BC patient's nutritional and functional status and oncologic outcomes, morbidity and mortality rates, perioperative complication risks, toxicities related to treatments,^{70,71} and quality of life.⁷² Despite this, the majority of cancer patients do not follow the dietary recommendations and do not achieve the recommended PA levels after being diagnosed with BC.^{73,74}

Our integrative model at FPG, through a nutritional and metabolic screening immediately after diagnosis, aims to tailor the recommendations to every patient, according to her attitudes and preferences, in order to improve adherence to healthy lifestyles.

Moreover, cancer patients usually show a strong interest in nonpharmacologic therapies and complementary approaches, but they frequently hold incorrect information and fail to distinguish between "integrative/complementary" and "alternative." Fears about toxicity, personal beliefs, and medical myths⁶⁰ are some of the reasons pushing patients toward expensive, useless, and potentially harmful remedies

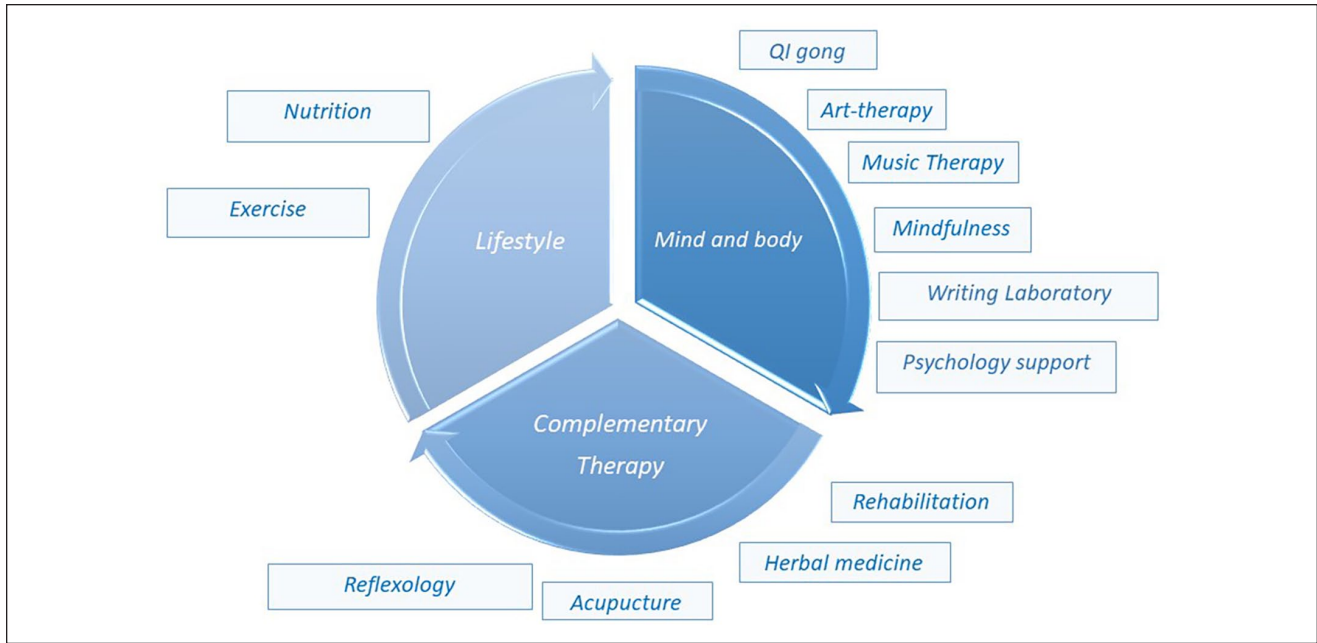


Figure 1. Services and group classes offered by FPG Center for Integrative Oncology.

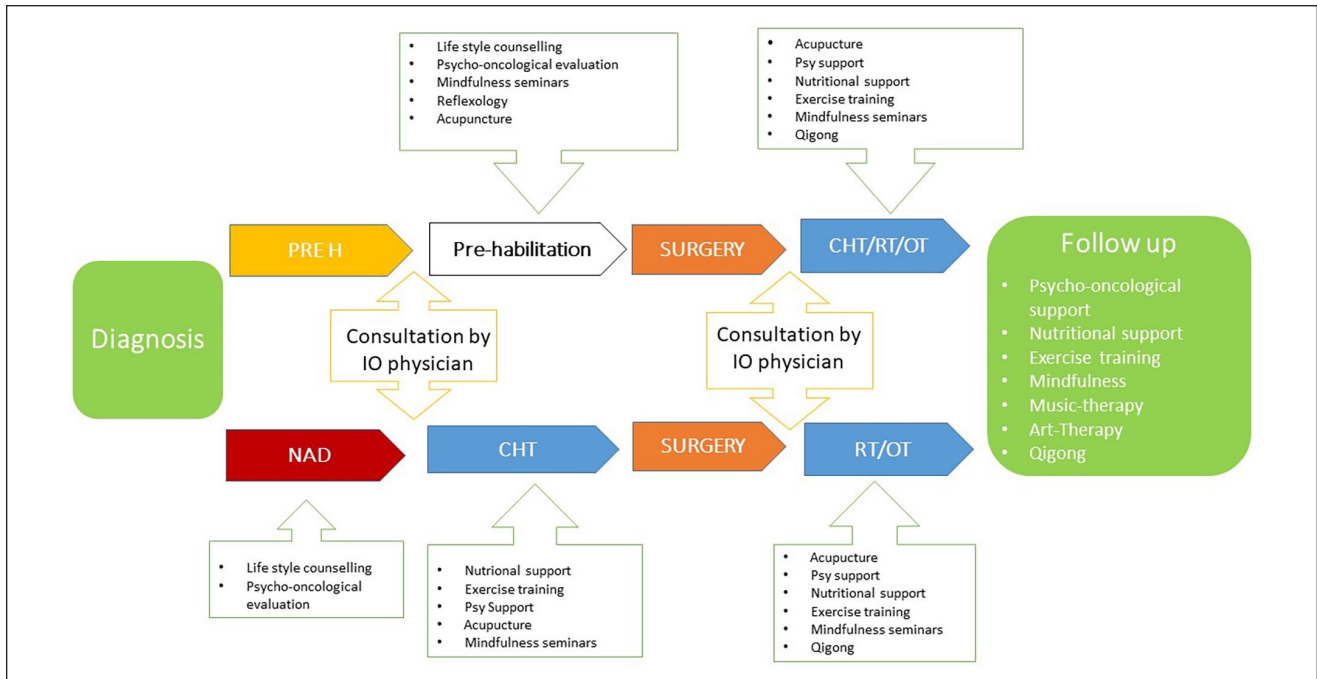


Figure 2. Center for integrative oncology program in FPG breast unit.

Abbreviations: NAD, neo-adjuvant therapy; IO, integrative oncology; CHT, chemotherapy; RT, radiotherapy; OT, hormonal therapy.

alternative to mainstream cancer care. According to the authors' experience, the chance to benefit from evidence based complementary therapies alongside conventional treatments within the hospital facility discourages patients to

search for alternatives, whilst it improves their quality of life and the compliance to mainstream protocols.⁷⁵

The present article has obviously many limitations: it does not include data characterizing the patient population,

the distribution of BC subtypes, and different stages of the disease. Furthermore, it does not provide information about the clinical outcomes for any given indication.

We aim to collect clinical data and questionnaires to assess whether this model is effective in order to improve patients' nutritional and lifestyle habits, quality of life, and eventually their adherence to the oncological protocols. Further studies are needed to assess what patients feel about the service and to validate this kind of approach as a standard of care.

Conclusion

Integrative Oncology combines lifestyle counseling, body-mind activities, and complementary therapies with anticancer standard care, in order to improve the management of symptoms, the adherence to oncological protocols and eventually overall quality of life before, during, and after treatments.

In the clinical management of a patient diagnosed with breast cancer, an adequate preoperative assessment should include nutritional and physical activity screening and body composition analysis in order to find out critical issues and leverage lifestyle interventions for improving outcomes. Alongside and beyond the mainstream oncological care, this integrative approach should be safe, rational, and evidence based, including reliable answers to the multiple unmet needs of every BC patient, in order to achieve a real person-centered medicine, rather than focused on the disease.

Declaration of Conflicting Interests

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Ethical Approval

The ethical review board of Fondazione Policlinico Gemelli determined that ethical approval of this study was not required.

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References

1. American Cancer Society. *Breast Cancer Facts & Figures 2019-2020*. American Cancer Society, Inc; 2019.
2. Mogal HD, Howard-McNatt M, Dodson R, Fino NF, Clark CJ. Quality of life of older African American breast cancer survivors: a population-based study. *Support Care Cancer*. 2017;25:1431-1438. doi:10.1007/s00520-016-3539-x
3. Fenlon D, Frankland J, Foster CL, et al. Living into old age with the consequences of breast cancer. *Eur J Oncol Nurs*. 2013;17:311-316. doi:10.1016/j.ejon.2012.08.004
4. Coughlin SS, Yoo W, Whitehead MS, Smith SA. Advancing breast cancer survivorship among African-American women. *Breast Cancer Res Treat*. 2015;153:253-261. doi:10.1007/s10549-015-3548-3
5. Hewitt M, Greenfield S, Stovall E. *From Cancer Patient to Cancer Survivor: Lost in Transition*. National Academies Press; 2006.
6. Page AE & Adler NE, eds. *Cancer Care for the Whole Patient: Meeting Psychosocial Health Needs*. National Academies Press; 2008.
7. Budhrani PH, Lengacher CA, Kip KE, Toftthagen C, Jim H. Minority breast cancer survivors: the association between race/ethnicity, objective sleep disturbances, and physical and psychological symptoms. *Nurs Res Pract*. 2014;2014:1-11. doi:10.1155/2014/858403
8. Meneses-Echávez JF, González-Jiménez E, Ramírez-Vélez R. Effects of supervised exercise on cancer-related fatigue in breast cancer survivors: a systematic review and meta-analysis. *BMC Cancer*. 2015;15:77. doi:10.1186/s12885-015-1069-4
9. Perkins EA, Small BJ, Balducci L, Extermann M, Robb C, Haley WE. Individual differences in well-being in older breast cancer survivors. *Crit Rev Oncol Hematol*. 2007;62:74-83. doi:10.1016/j.critrevonc.2006.11.002
10. Friese CR, Harrison JM, Janz NK, et al. Treatment-associated toxicities reported by patients with early-stage invasive breast cancer. *Cancer*. 2017;123:1925-1934. doi:10.1002/cncr.30547
11. Alfano CM, Peng J, Andridge RR, et al. Inflammatory cytokines and comorbidity development in breast cancer survivors versus noncancer controls: evidence for accelerated aging? *J Clin Oncol*. 2017;35:149-156. doi:10.1200/JCO.2016.67.1883
12. Deng GE, Rausch SM, Jones LW, et al. Complementary therapies and integrative medicine in lung cancer: diagnosis and management of lung cancer, 3rd ed: American College of Chest Physicians evidence-based clinical practice guidelines. *Chest*. 2013;143:e420S-e436S. doi:10.1378/chest.12-2364.
13. Grant SJ, Hunter J, Seely D, Balneaves LG, Rossi E, Bao T. Integrative oncology: international perspectives. *Integr Cancer Ther*. 2019;18:1534735418823266. doi:10.1177/1534735418823266
14. Horneber M, Bueschel G, Dennert G, Less D, Ritter E, Zwahlen M. How many cancer patients use complementary and alternative medicine: a systematic review and metaanalysis. *Integr Cancer Ther*. 2012;11:187-203. doi:10.1177/1534735411423920
15. Greenlee H, Kwan ML, Ergas IJ, et al. Complementary and alternative therapy use before and after breast cancer diagnosis: the pathways study. *Breast Cancer Res Treat*. 2009;117:653-665. doi:10.1007/s10549-009-0315-3
16. Greenlee H, Balneaves LG, Carlson LE, et al. Clinical practice guidelines on the use of integrative therapies as

- supportive care in patients treated for breast cancer. *J Natl Cancer Inst Monographs*. 2014;2014:346-358. doi:10.1093/jncimonographs/lgu041
17. Boon HS, Olatunde F, Zick SM. Trends in complementary/alternative medicine use by breast cancer survivors: comparing survey data from 1998 and 2005. *BMC Womens Health*. 2007;7:4. doi:10.1186/1472-6874-7-4
 18. Oh B, Butow P, Mullan B, et al. The use and perceived benefits resulting from the use of complementary and alternative medicine by cancer patients in Australia. *Asia Pac J Clin Oncol*. 2010;6:342-349. doi:10.1111/j.1743-7563.2010.01329.x
 19. Brown JC, Ligibel JA. The role of physical activity in oncology care. *J Natl Cancer Inst Monographs*. 2017;2017:52. doi:10.1093/jncimonographs/lgx017
 20. Lopez G, McQuade J, Cohen L, et al. Integrative oncology physician consultations at a comprehensive cancer center: analysis of demographic, clinical and patient reported outcomes. *J Cancer*. 2017;8:395-402. doi:10.7150/jca.17506
 21. Witt CM, Balneaves LG, Cardoso MJ, et al. A comprehensive definition for integrative oncology. *J Natl Cancer Inst Monographs*. 2017;2017:52. Igx012. doi:10.1093/jncimonographs/lgx012
 22. Greenlee H, DuPont-Reyes MJ, Balneaves LG, et al. Clinical practice guidelines on the evidence-based use of integrative therapies during and after breast cancer treatment. *CA Cancer J Clin*. 2017;67:194-232. doi:10.3322/caac.21397
 23. Lyman GH, Greenlee H, Bohlke K, et al. Integrative therapies during and after breast cancer treatment: ASCO endorsement of the SIO clinical practice guideline. *J Clin Oncol*. 2018;36:2647-2655. doi:10.1200/JCO.2018.79.2721
 24. Rossi E, Di Stefano M, Firenzuoli F, Monechi MV, Baccetti S. Add-on complementary medicine in cancer care: evidence in literature and experiences of integration. *Medicines*. 2017;4:5. doi:10.3390/medicines4010005
 25. Bongers BC, Dejong CHC, den Dulk M. Enhanced recovery after surgery programmes in older patients undergoing hepatopancreatobiliary surgery: what benefits might prehabilitation have? *Eur J Surg Oncol*. 2021;47:551-559. doi:10.1016/j.ejso.2020.03.211
 26. World Cancer Research Fund International/American Institute for Cancer Research. Continuous update project report: diet, nutrition, physical activity and cancer. 2018. Accessed August 3, 2021. dietandcancerreport.org
 27. Fukuda Y, Yamamoto K, Hirao M, et al. Prevalence of malnutrition among gastric cancer patients undergoing gastrectomy and optimal preoperative nutritional support for preventing surgical site infections. *Ann Surg Oncol*. 2015;22 Suppl 3:S778-S785. doi:10.1245/s10434-015-4820-9
 28. Prado CM, Baracos VE, McCargar LJ, et al. Sarcopenia as a determinant of chemotherapy toxicity and time to tumor progression in metastatic breast cancer patients receiving capecitabine treatment. *Clin Cancer Res*. 2009;15:2920-2926. doi:10.1158/1078-0432.CCR-08-2242
 29. Carbone L, Trestini I, Sperduti I, et al. Prospective trial in early-stage breast cancer (EBC) patients (pts) submitted to nutrition evidence-based educational intervention: early results of adherence to dietary guidelines (ADG) and body weight change (BWC). *J Clin Oncol*. 2019;37:11575-11575. doi:10.1200/JCO.2019.37.15_suppl.11575
 30. Iyengar NM, Zhou XK, Gucalp A, et al. Systemic correlates of white adipose tissue inflammation in early-stage breast cancer. *Clin Cancer Res*. 2016;22:2283-2289. doi:10.1158/1078-0432.CCR-15-2239
 31. Rock CL, Thomson C, Gansler T, et al. American cancer Society guideline for diet and physical activity for cancer prevention. *CA Cancer J Clin*. 2020;70:245-271. doi:10.3322/caac.21591
 32. Pierce JP, Stefanick ML, Flatt SW, et al. Greater survival after breast cancer in physically active women with high vegetable-fruit intake regardless of obesity. *J Clin Oncol*. 2007;25:2345-2351. doi:10.1200/JCO.2006.08.6819
 33. Zia FZ, Olaku O, Bao T, et al. The National Cancer Institute's conference on acupuncture for symptom management in oncology: state of the science, evidence, and research Gaps. *J Natl Cancer Inst Monographs*. 2017;2017. doi:10.1093/jncimonographs/lgx005
 34. Mao JJ, Bowman MA, Xie SX, Bruner D, DeMichele A, Farrar JT. Electroacupuncture versus gabapentin for hot flashes among breast cancer survivors: a randomized placebo-controlled trial. *J Clin Oncol*. 2015;33:3615-3620. doi:10.1200/JCO.2015.60.9412
 35. Lesi G, Razzini G, Musti MA, et al. Acupuncture as an integrative approach for the treatment of hot flashes in women with breast cancer: a prospective multicenter randomized controlled trial (AcCliMaT). *J Clin Oncol*. 2016;34:1795-1802. doi:10.1200/JCO.2015.63.2893
 36. Hu C, Zhang H, Wu W, et al. Acupuncture for pain management in cancer: a systematic review and meta-analysis. *Evid Based Complement Alternat Med*. 2016;2016:1720239. doi:10.1155/2016/1720239
 37. Ju ZY, Wang K, Cui HS, et al. Acupuncture for neuropathic pain in adults. *Cochrane Database Syst Rev*. 2017;12. CD012057. doi:10.1002/14651858.CD012057.pub2
 38. Molassiotis A, Suen LKP, Cheng HL, et al. A randomized assessor-blinded wait-list-controlled trial to assess the effectiveness of acupuncture in the management of chemotherapy-induced peripheral neuropathy. *Integr Cancer Ther*. 2019;18. doi:10.1177/1534735419836501
 39. Wardley AM, Ryder D, Misra V, Hall PS, Mackereth P, Stringer J. ACUFOCIN: randomized clinical trial of ACUpuncture plus standard care versus standard care alone for chemotherapy induced peripheral neuropathy (CIPN). *J Clin Oncol*. 2020;38:12003-12003. doi:10.1200/JCO.2020.38.15_suppl.12003
 40. Bao T, Patil S, Chen C, et al. Effect of acupuncture vs sham procedure on chemotherapy-induced peripheral neuropathy symptoms: a randomized clinical trial. *JAMA Netw Open*. 2020;3:e200681. doi:10.1001/jamanetworkopen.2020.0681
 41. Jordan B, Margulies A, Cardoso F, et al. Systemic anti-cancer therapy-induced peripheral and central neurotoxicity: ESMO-EONS-EANO clinical practice guidelines for diagnosis, prevention, treatment and follow-up. *Ann Oncol*. 2020;31:1306-1319. Doi:10.1016/j.annonc.2020.07.003
 42. Hoffman CJ, Ersser SJ, Hopkinson JB, Nicholls PG, Harrington JE, Thomas PW. 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. *J Clin Oncol*. 2012;30:1335-1342. doi:10.1200/JCO.2010.34.0331

43. Henderson VP, Clemow L, Massion AO, Hurley TG, Druker S, Hébert JR. The effects of mindfulness-based stress reduction on psychosocial outcomes and quality of life in early-stage breast cancer patients: a randomized trial. *Breast Cancer Res Treat.* 2012;131:99-109. doi:10.1007/s10549-011-1738-1
44. Lerman R, Jarski R, Rea H, Gellish R, Vicini F. Improving symptoms and quality of life of female cancer survivors: a randomized controlled study. *Ann Surg Oncol.* 2012;19:373-378. doi:10.1245/s10434-011-2051-2
45. Gross CR, Kreitzer MJ, Reilly-Spong M, et al. Mindfulness-based stress reduction versus pharmacotherapy for chronic primary insomnia: a randomized controlled clinical trial. *Explore (NY).* 2011;7:76-87. doi:10.1016/j.explore.2010.12.003
46. Shapiro SL, Bootzin RR, Figueredo AJ, Lopez AM, Schwartz GE. The efficacy of mindfulness-based stress reduction in the treatment of sleep disturbance in women with breast cancer: an exploratory study. *J Psychosom Res.* 2003;54:85-91. doi:10.1016/s0022-3999(02)00546-9
47. Carlson LE, Speca M, Patel KD, Goodey E. Mindfulness-based stress reduction in relation to quality of life, mood, symptoms of stress, and immune parameters in breast and prostate cancer outpatients. *Psychosom Med.* 2003;65:571-581. doi:10.1097/01.psy.0000074003.35911.41
48. Carlson LE, Garland SN. Impact of mindfulness-based stress reduction (MBSR) on sleep, mood, stress and fatigue symptoms in cancer outpatients. *Int J Behav Med.* 2005;12:278-285. doi:10.1207/s15327558ijbm1204_9
49. Würtzen H, Dalton SO, Elsass P, et al. Mindfulness significantly reduces self-reported levels of anxiety and depression: results of a randomised controlled trial among 336 Danish women treated for stage I-III breast cancer. *Eur J Cancer.* 2013;49:1365-1373. doi:10.1016/j.ejca.2012.10.030
50. Lengacher CA, Reich RR, Paterson CL, et al. Examination of broad symptom improvement resulting from mindfulness-based stress reduction in breast cancer survivors: a randomized controlled trial. *J Clin Oncol.* 2016;34:2827-2834. doi:10.1200/JCO.2015.65.7874
51. Andersen SR, Würtzen H, Steding-Jessen M, et al. Effect of mindfulness-based stress reduction on sleep quality: results of a randomized trial among Danish breast cancer patients. *Acta Oncol.* 2013;52:336-344. doi:10.3109/0284186X.2012.745948
52. Johns SA, Von Ah D, Brown LF, et al. Randomized controlled pilot trial of mindfulness-based stress reduction for breast and colorectal cancer survivors: effects on cancer-related cognitive impairment. *J Cancer Surviv.* 2016;10:437-448. doi:10.1007/s00520-016-3220-4
53. Garland SN, Tamagawa R, Todd SC, Speca M, Carlson LE. Increased mindfulness is related to improved stress and mood following participation in a mindfulness-based stress reduction program in individuals with cancer. *Integr Cancer Ther.* 2013;12:31-40. doi:10.1177/1534735412442370
54. Paice JA, Portenoy R, Lacchetti C, et al. Management of chronic pain in survivors of adult cancers: American Society of Clinical Oncology clinical practice guideline. *J Clin Oncol.* 2016;34:3325-3345. doi:10.1200/JCO.2016.68.5206
55. Schure MB, Christopher J, Christopher S. Mind-body medicine and the art of self-care: teaching mindfulness to counseling students through yoga, meditation, and qigong. *J Couns Dev.* 2008;86:47-56. doi:10.1002/j.1556-6678.2008.tb00625.x
56. Chen Z, Meng Z, Milbury K, et al. Qigong improves quality of life in women undergoing radiotherapy for breast cancer: results of a randomized controlled trial. *Cancer.* 2013;119:1690-1698. doi:10.1002/cncr.27904
57. Panchik D, Masco S, Zinnikas P, et al. Effect of exercise on breast cancer-related lymphedema: what the lymphatic surgeon needs to know. *J Reconstr Microsurg.* 2019;35:37-045. doi:10.1055/s-0038-1660832
58. Tsay SL, Chen HL, Chen SC, Lin HR, Lin KC. Effects of reflexotherapy on acute postoperative pain and anxiety among patients with digestive cancer. *Cancer Nurs.* 2008;31:109-115. doi:10.1097/01.NCC.0000305694.74754.7b
59. Magno S, Cappai E, Dentale F, et al. Effects of plantar reflexology on sleep and quality of life in patients with breast cancer undergoing chemotherapy and hormonal therapies. *J Clin Oncol.* 2017;35:e21697-e21697. doi:10.1200/JCO.2017.35.15_suppl.e21697
60. Binns-Turner PG, Wilson LL, Pryor ER, Boyd GL, Prickett CA. Perioperative music and its effects on anxiety, hemodynamics, and pain in women undergoing mastectomy. *AANA J.* 2011;79:S21-S27.
61. Bulfone T, Quattrin R, Zanotti R, Regattin L, Brusaferrero S. Effectiveness of music therapy for anxiety reduction in women with breast cancer in chemotherapy treatment. *Holist Nurs Pract.* 2009;23:238-242. doi:10.1097/HNP.0b013e3181aeceee
62. Hanser SB, Bauer-Wu S, Kubicek L, et al. Effects of a music therapy intervention on quality of life and distress in women with metastatic breast cancer. *J Soc Integr Oncol.* 2006;4:116-124. doi:10.2310/7200.2006.014
63. Li XM, Zhou KN, Yan H, Wang DL, Zhang YP. Effects of music therapy on anxiety of patients with breast cancer after radical mastectomy: a randomized clinical trial. *J Adv Nurs.* 2012;68:1145-1155. doi:10.1111/j.1365-2648.2011.05824.x
64. Zhou K, Li X, Li J, et al. A clinical randomized controlled trial of music therapy and progressive muscle relaxation training in female breast cancer patients after radical mastectomy: results on depression, anxiety and length of hospital stay. *Eur J Oncol Nurs.* 2015;19:54-59. doi:10.1016/j.ejon.2014.07.010
65. Wang X, Zhang Y, Fan Y, Tan XS, Lei X. Effects of music intervention on the physical and mental status of patients with breast cancer: a systematic review and meta-analysis. *Breast Care.* 2018;13:183-190. doi:10.1159/000487073
66. Atkinson TM, Liou KT, Borten MA, et al. Association between music therapy techniques and patient-reported moderate to severe fatigue in hospitalized adults with cancer. *J Oncol Pract.* 2020;16:e1553-e1557. doi:10.1200/OP.20.00096
67. Magno S, Filippone A, Scaldaferrri A. Evidence-based usefulness of integrative therapies in breast cancer. *Transl Cancer Res.* 2018;7:S379-S389. doi:10.21037/tcr.2018.02.06
68. Nainis N, Paice JA, Ratner J, Wirth JH, Lai J, Shott S. Relieving symptoms in cancer: innovative use of art therapy. *J Pain Symptom Manag.* 2006;31:162-169. doi:10.1016/j.jpainsymman.2005.07.006
69. Czamanski-Cohen J, Wiley JF, Sela N, Caspi O, Weihs K. The role of emotional processing in art therapy (REPAT) for

- breast cancer patients. *J Psychosoc Oncol*. 2019;37:586-598. doi:10.1080/07347332.2019.1590491
70. Aaldriks AA, van der Geest LG, Giltay EJ, et al. Frailty and malnutrition predictive of mortality risk in older patients with advanced colorectal cancer receiving chemotherapy. *J Geriatr Oncol*. 2013;4:218-226. doi:10.1016/j.jgo.2013.04.001
71. Seo SH, Kim SE, Kang YK, et al. Association of nutritional status-related indices and chemotherapy-induced adverse events in gastric cancer patients. *BMC Cancer*. 2016;16:900. doi:10.1186/s12885-016-2934-5
72. Gellrich NC, Handschel J, Holtmann H, Krüskemper G. Oral cancer malnutrition impacts weight and quality of life. *Nutrients*. 2015;7:2145-2160. doi:10.3390/nu7042145
73. Irwin ML, Crumley D, McTiernan A, et al. Physical activity levels before and after a diagnosis of breast carcinoma: the health, eating, activity, and lifestyle (HEAL) study. *Cancer*. 2003;97:1746-1757. doi:10.1002/cncr.11227
74. de Glas NA, Fontein DB, Bastiaannet E, et al. Physical activity and survival of postmenopausal, hormone receptor-positive breast cancer patients: results of the tamoxifen exemestane adjuvant multicenter lifestyle study. *Cancer*. 2014;120:2847-2854. doi:10.1002/cncr.28783.
75. Verhoef MJ, Rose MS, White M, Balneaves LG. Declining conventional cancer treatment and using complementary and alternative medicine: a problem or a challenge? *Curr Oncol*. 2008;15 Suppl 2:s101-s106. doi:10.3747/co.v15i0.281