Published in final edited form as:

Breast Cancer Manag. 2013 January ; 2(1): 71–81. doi:10.2217/bmt.12.63.

Breast cancer survivorship symptom management: current perspective and future development

G van Londen^{*,1}, EB Beckjord², MA Dew³, P Cuijpers⁴, S Tadic⁵, and A Brufsky⁶

¹University of Pittsburgh, Department of Medicine (Hematology–Oncology, Geriatric Medicine) & Clinical & Translational Science Institute, Pittsburgh, PA, USA ²University of Pittsburgh, Department of Psychiatry, Biobehavioral Medicine in Oncology Program, University of Pittsburgh Cancer Institute, Pittsburgh, PA, USA ³University of Pittsburgh, Departments of Psychiatry, Psychology, Epidemiology & Biostatistics, Pittsburgh, PA, USA ⁴VU University, Department of Clinical Psychology, Amsterdam, The Netherlands ⁵University of Pittsburgh, Department of Medicine (Geriatric Medicine) & Clinical & Translational Science Institute, Pittsburgh, PA, USA ⁶University of Pittsburgh, Department of Medicine (Hematology–Oncology), Pittsburgh, PA, USA

SUMMARY

Increasing numbers and longevity of cancer survivors has furthered our insight into the factors affecting their health outcomes, suggesting that multiple factors play a role (e.g., effects of cancer treatments and health behaviors). Emotional and physical symptoms may not always receive sufficient attention. In this short narrative review highlighting recent literature, we describe the most common physical and emotional symptoms of breast cancer survivors aged 50 years and older and outline a multidisciplinary symptom management approach, regardless of symptom etiology.

The National Coalition for Cancer Survivorship and the NIH define a cancer survivor as “an individual from the time of cancer diagnosis, through the balance of his or her life” [1,201,202]. Due to improvements in cancer care, including earlier detection and better treatment, the number of cancer survivors in the USA has been steadily increasing over the last 30 years (~12 million in 2007) and is expected to continue to rise [2,203]. Cancer survivors also live longer after cancer diagnosis (~5 million survive more than 10 years) [203] and two-thirds are aged 65 years and over [203]. Nevertheless, increased survival brings multiple challenges that range from an increased risk for cancer recurrence and the development of second or other primary cancers, to a host of chronic conditions (e.g., osteoporosis, cardiovascular disease, thromboembolic disease and cognitive impairment), and clusters of bothersome physical and emotional symptoms [3], as shown on Figure 1 [204]. Evidence that underlying pathophysiological changes in survivors’ immune, neuroendocrine, metabolic and central nervous systems, including the sleep–wake cycle [4,5], contribute to these symptoms is emerging. Successfully managing these

* Author for correspondence: Tel.: +1 412 692 2382; Fax: +1 412 623 5980; vanLondenJ@upmc.edu.

For reprint orders, please contact: reprints@futuremedicine.com

Financial & competing interests disclosure

Research reported in this publication was supported in part by the National Center For Advancing Translational Sciences of the NIH under Award Number KL2TR000146, the Pittsburgh Older Americans Independence Center under Award Number P30 AG024827 09, the Hartford Foundation, Magee-Womens Research Institute & Foundation and the Pittsburgh Affiliate of Susan G Komen for the Cure. The authors have no other relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript apart from those disclosed.

No writing assistance was utilized in the production of this manuscript.

symptoms in clinical practice is crucial for several reasons. First, breast cancer survivors utilize more care during their first 5 years after diagnosis than their age-matched controls [6], yet often report that their needs have not been met [7,8,204]. Second, poorly controlled symptoms may lead to decreased adherence to adjuvant endocrine therapy [9,10]. Indeed, some studies show only 50% adherence to completion of 5-year adjuvant endocrine therapy treatment regimens [9,11–15], leading to inferior survival [16]. Third, while most breast cancer survivors report comparable quality of life (QoL) to age-matched controls [17–19] and experience post-traumatic growth after cancer [20], for a subset of survivors, physical and emotional symptoms can disrupt their QoL [21].

Breast cancer survivors' outcomes depend not only on their prognosis, but also on a host of other factors [22], including adverse effects of cancer treatment [23], access to and availability of survivorship care, social, economic, cultural and medical care variables [17,24], QoL [25,26] and health behaviors (Figure 2) [27–29]. Although substantial numbers of breast cancer survivors do not adhere to recommended health maintenance [30,31], engaging in positive health behaviors, such as limiting alcohol intake, smoking cessation, achieving and maintaining a healthy weight and regular physical activity, can significantly reduce survivors' risk of recurrence [22,32–35]. However, benefits may be impeded by cancer- and treatment-related morbidity, particularly if the symptoms contributing to morbidity are not well controlled [34,36–38,204].

As a consequence of these changes in cancer survivorship, organizations such as the US CDC have called for “medical and public health professionals to: a) address the potential long-term and late effects of cancer and related therapy on survivors' physical and psychosocial well-being, b) provide survivors with coordinated care to address their multiple symptoms, and, c) promote the importance of healthy behaviors (e.g., smoking cessation and physical activity) to reduce the risk for new or recurrent cancer and early detection to increase the likelihood of survival with new or recurrent cancer” [203]. QoL of long-term cancer survivors has been proposed to be comprised of four primary domains of well-being: psychological, social, physical and spiritual [39]. Given a number of comprehensive overviews of the entire spectrum of breast cancer survivorship QoL [40–44], we sought to provide an update of the most recently published literature. Thus, in our brief narrative review, we will highlight critical work in the field, prioritizing the last 2 years of research, with the intention of providing clinicians with practical suggestions to inform their practices. Our focus is on the most common physical and emotional symptoms of breast cancer survivors aged 50 years and older (who represent the bulk of breast cancer survivors [2,45]), and we will outline a multidisciplinary symptom management approach, regardless of symptom etiology, to improve their physical and psychological QoL. The purpose of our article was not to compare different care models, but to stress/promote the importance of screening for symptoms and involving other disciplines early on in a proactive manner (e.g., behavioral health, physical therapy, nutritional services and complementary medicine) in the hopes of forming a supportive management strategy of symptomatic breast cancer survivors.

Multidisciplinary management of symptoms & concerns in breast cancer survivors

Due to prolonged survival and increased lifespan, there is some indication that breast cancer survivors' physical function might decline faster than that of their peers and that these survivors might benefit from an approach that is routinely applied in the aging population [46]. First, survivors experience multiple, clustering and chronic symptoms [7,8,47,48,204]. Second, survivors demonstrate physical, psychological and behavioral changes that may impair their functional status and lead to dependence and disability [46], as demonstrated by higher fall risk [49], decreased physical activity [204] and

observed limitations in both basic and advanced activities of daily living [50,51]. Therefore, a subset of symptomatic breast cancer survivors stand to benefit from a management approach that is routinely applied in the geriatric medicine setting, one that is: multidisciplinary (e.g., physical and behavioral factors); multifactorial (i.e., one intervention targets multiple symptoms simultaneously); increased use of nonpharmacological treatment options; and setting therapeutic goals (i.e., recognizing that complete resolution may not be achieved, but improvement is likely) [46,51–55]. In a below section, we illustrate this concept by highlighting basic assessment and management principles that apply equally across many commonly observed physical and emotional symptoms in breast cancer survivors, such as cognitive dysfunction [5,56–59], adjustment disorder or other psychosocial distress [7,8,60–64], vasomotor symptoms [41–43,65] and insomnia and fatigue [62,66–71].

Psychophysiological symptoms

A comprehensive approach to symptom management starts with an evaluation as to whether symptoms can be exclusively attributed to cancer and related treatments and procedures (including anesthesia) or to other contributing factors that are potentially reversible. These factors are numerous and may include vitamin deficiencies, anemia, organ dysfunction and endocrine, metabolic or intracranial abnormalities. Appropriate assessments include blood work, imaging studies and/or neuropsychological testing. In addition, careful listening to survivors, education and multifactorial support (e.g., with input from other disciplines, such as behavioral medicine or physical therapy) tailored to survivors' needs might have significant therapeutic value for survivors.

Management may include pharmacological therapy (e.g., antidepressants or stimulants) in combination with a variety of nonpharmacological interventions, such as physical therapy, psychological support, nutritional counseling and complementary medicine. Some of these treatments affect multiple symptoms, which is preferable. For example, increasing physical activity not only improves functional status, fitness and survival, but also helps improve QoL [62], emotional, cognitive and physical symptoms [62] and overall and cancer-related mortality [27–29]. An informed conversation can help outline an individualized management approach that accounts for prior treatments, patient preferences and insurance coverage [41]. Pursuing nonpharmacological management can be challenging, as it often requires more active participation of the survivor (e.g., time and expense). For example, cancer survivors might be challenged in their pursuit to initiate, resume or increase the level of physical activity by logistical barriers, acquired physical limitations or a fear of harm [38,48]. In these instances, a certified cancer exercise trainer [205] or a physical therapist is a valuable resource. Cancer survivors may feel discouraged when suffering with chronic symptoms, and although most breast cancer survivors cope well, some survivors become significantly burdened by symptoms, and in this instance, a brief course of psychological therapy focused on empowerment, increased self-care and coping skills may prove helpful [72,73].

Musculoskeletal symptoms

Musculoskeletal symptoms are very prevalent among breast cancer survivors, whether due to chemotherapy, menopause or aromatase inhibitor therapy. More than 50% of breast cancer survivors experience a musculoskeletal syndrome upon initiation of an aromatase inhibitor, usually as either new or worsened diffuse arthralgias and myalgias, which most often improve within 2–3 months [74–82]. Approximately 30% of breast cancer survivors need to discontinue initial adjuvant aromatase inhibitor therapy due to adverse effects (~25% because of musculoskeletal symptoms) [83]. Although a causal relationship is likely to be due to cancer treatment or menopausal transition, new diagnoses, such as autoimmune or crystalline arthritis, should not be overlooked. Treatment approaches are similar to those of osteoarthritis and may include nonpharmacological methods such as physical therapy,

local heat and/or acupuncture, in combination with pharmacological therapy, such as short-term administration of NSAIDs, either systemically or topically.

In addition to arthralgia-type symptoms, breast cancer survivors may develop fibrosis, rotator cuff pathology and altered body habitus, leading to pain, limited range of motion and impaired function in daily life, which are considered to be consequences of locoregional treatment with surgery, with or without radiation therapy. Axillary web syndrome is the most extreme presentation of these symptoms [84,85]. Physical and massage therapists are of great value as they are able to provide symptom relief by administering an intense regimen of massage, stretching and exercises that minimizes the need for surgical therapy. Additional psychological support to help patients cope with pain can also be helpful.

Sexual dysfunction & urinary complaints

More than half of breast cancer survivors, and especially those on adjuvant endocrine therapy or with cancer therapy-induced premature menopause, suffer from sexual dysfunction [41–43,86–89] and urinary symptoms [49,90,91]. Sexual dysfunction may include vaginal atrophy, diminished libido or pain during intercourse. Changes in libido can be due to multiple causes, which include mood, pain, body image, fatigue, relationship issues and estrogen deprivation. Sexual complaints may be at least partially alleviated by the use of a combination of local nonhormonal applications (e.g., moisturizers, lubricants and vitamin E), a low dose of topical estrogens (usually as a last resort and only upon an informed conversation), physical therapy (e.g., pelvic floor muscles exercises), gynecologic strategies (e.g., vaginal dilatational mechanical measures) and psychological care (e.g., exploring causes of decreased libido, coping strategies and partner communication).

Urinary issues may include overactive bladder with urgency, with or without incontinence. Management options for sexual and urinary symptoms partially overlap. Urinary complaints can often be helped by pelvic floor muscle exercises, topical estrogen and, in some cases, with a referral to a urogynecologist.

Bone health

It is estimated that osteoporosis affects one in every three postmenopausal women, with a 40% lifetime risk of fracture and approximately 21% risk of 1-year mortality after hip fracture [206]. Breast cancer survivors are at an even higher risk of bone loss due to chemotoxic effects on the bone, treatment-induced hypogonadism and supportive therapies that include steroids [49,92–96]. Fracture risk is not only determined by bone mass, as measured by a dual-energy x-ray absorptiometry scan, but also by the propensity to fall, which may be negatively affected by cancer or its treatment (e.g., due to chemotherapy-induced neuropathy, deconditioning, urinary incontinence, vitamin D deficiency and cognitive impairment). Simple measures, such as weight-bearing exercises, minimal or no consumption of nicotine/alcohol and an adequate daily intake of calcium and vitamin D (600 mg/400 IU twice daily), are important in fracture risk reduction [97]. Given the evidence of an association between calcium intake and acceleration of coronary artery disease [98], it might be important to tailor one's individual pill supplementation to one's average dietary intake with help from a dietitian [207]. For pharmacological interventions to support bone health, selection of an agent and timing of its initiation remain challenging. Gralow *et al.* have created an algorithm that includes the FRAX[®] calculator in an effort to individualize the initiation of bone medications based on a survivor's 10-year fracture risk [95,208]. An informed conversation regarding the pros and cons of bone medications between the survivor and the provider is essential. Survivors should be monitored with baseline and surveillance dual-energy x-ray absorptiometry scans every 2 years.

Cardiovascular health

Breast cancer survivors are at increased risk of cardiovascular events. Its cumulative incidence may be as high as 33% [99] if the patient experienced premature, chemotherapy-induced menopause [100,101] or received aromatase inhibitor therapy [23,29,102–105] and/or left-sided chest wall radiation [105]. Cardiac toxicity is not only limited to coronary artery disease, but may also lead to cardiomyopathy, thromboembolism, arrhythmias and valvular or pericardial disease [99]. It is important to assess and control cardiovascular risk factors including weight, physical fitness, lipid profile and glucose tolerance. A dietitian, psychologist, personal trainer or physical therapist may help facilitate these efforts. Evidence is growing that, for a subset of breast cancer survivors, the benefits of aromatase inhibitor therapy for reducing future breast cancer risk may not outweigh the risks the therapy poses to cardiovascular health [23].

Conclusion & future perspective

Strategies to improve breast cancer survivorship symptom care

The number and longevity of breast cancer survivors is increasing, and their symptomatology can be burdensome, complex, chronic and is often undertreated. Growing evidence has revealed that symptom management allows for improvement of QoL [106], while evidence about its ability to reduce healthcare utilization is scarce. An impending shortage of cancer providers [107] suggests that cancer survivorship care needs to be revolutionized to allow a better and more individualized outreach to survivors (residing mostly in communities without easy access to an academic medical center) [108] in a cost-effective, financially sustainable and easily replicable manner.

In terms of content, Ganz has promoted the ‘three Ps’ concept; in other words:

“...palliation of ongoing symptoms; prevention of late effects of cancer treatment or second cancers; and health promotion to maximize future wellness” [109].

To further refine this, the **LIVESTRONG** convened researchers, clinicians and advocates to generate consensus on the ‘essential elements’ of survivorship care [209]. This process resulted in the consensus that all medical settings offering survivorship care must, at a minimum, provide direct access or referral to the following: a survivorship care plan; a psychosocial care plan and treatment summary; screening for new cancers and surveillance for recurrence; a care coordination strategy that addresses care coordination with primary care physicians and primary oncologists; health promotion education; and symptom management and palliative care.

In terms of care delivery, investigators have examined different types of providers (e.g., generalist and specialist physicians, physician extenders, nurses and navigators) [110–119], as well as, to a lesser degree, different care strategies (e.g., transitional, consultative and integrative) [108,120]. Although encounters are mostly performed in the traditional ‘face-to-face’ manner, in keeping with the movement towards the Accountable Care Organization [210], remote or virtual options might become increasingly popular and feasible (e.g., telephone [121], videoconferencing or [a] synchronous messaging). Timing of encounters can also vary. Some centers perform traditional consultative visits, while others alternate or even transition breast cancer survivors from their current cancer providers into a devoted survivorship program (some upon completion of acute treatment, and others years after diagnosis) [108,114]. Very few of these combinations have been compared head-to-head in terms of acceptability, feasibility and effectiveness. Therefore, studies are needed to explore the costs, feasibility and reproducibility of these various cancer survivorship care strategies [44].

Tailoring assistance to the needs of individual cancer survivors will be crucial in order to prioritize limited resources. First, identification and referral of cancer survivors who are in need could be facilitated proactively by many different methods, including self-assessments administered by use of technology or navigators [114,118,122–124]. One example of a validated measure that is easy to administer in a clinical setting is the Breast Cancer Prevention Trial Scale, which assesses somatic symptoms among breast cancer survivors on hormonal therapy [125]. The FACT-ES survey allows assessment of endocrine symptoms [211]. A validated measure that probes emotional symptoms is the Center for Epidemiologic Studies – Depression Scale and the Hospital Anxiety and Depression Scale [126]. Survivors can be adequately supported through low-cost educational resources (in person, by phone or online), while others may require more comprehensive, face-to-face, multidisciplinary intervention. Although a framework has yet to be established in terms of how to assess physical and emotional symptoms, impairment over time and early intervention, recent publications have increased awareness of the need to integrate physical therapy [127–129] and behavioral medicine [130] into a cancer survivor's care. This stepped-care approach is currently being investigated among survivors of head and neck cancer or lung cancers [131].

Prescribing symptom management options can be challenging. First, having been exposed to toxic treatments, breast cancer survivors often favor nonpharmacological treatment approaches [106]. However, their costs may accumulate due to co-pays and limited health plan coverage. The latter applies to complementary medicine approaches in particular. Second, increased insight into pathophysiological changes during survivorship by assessing cancer survivors' concerns and their changes over time in correlation with biological samples (e.g., serum, urine and fat/muscle biopsy) would enable the development of more individualized and, thus, more effective support. Third, there is a lack of evidence concerning both general and age-specific symptom management in cancer survivors. Thus, comparative effectiveness studies of various combinations of pharmacological and nonpharmacological agents are needed. Fourth, some breast cancer survivors are unable to make long-term lifestyle changes due to deconditioning, high symptom burden or lack of motivation [132]. Thus, it might be helpful to receive proactive guidance from an easily accessible and affordable physical therapist or (cancer certified) personal trainer who could design a regimen that adapts to and slowly builds on one's limitations. Other possible strategies to improve and maintain healthier behaviors might include direct feedback from patients (e.g., obtained via technological devices or online [interactive] resources) [114,122,133] or utilization of community-based cancer-specific exercise programs [22,134,135,212]. Research on health behaviors in the cancer population is rapidly growing [136,137] and will contribute to cancer-specific health behavior recommendations [22,138,213]. Fifth, increased attention to and care for symptoms may also help improve suboptimal adherence rates to long-term hormonal cancer therapies [83]. Finally, experiencing chronic symptoms without sufficient relief can result in a vicious cycle of discouragement, decreased self-help and worsening of physical and emotional symptoms [63,139]. Therefore, behavioral interventions that target self-care and empowerment – delivered face-to-face or virtually – may be required to overcome this vicious cycle, as demonstrated in prostate [140] and breast cancer survivors [141], as well as persons at high risk for depression [142].

There is evidence that health maintenance and cancer screening among cancer survivors can be further improved [143]. Cancer survivors often fall between the cracks because they receive care from multiple providers [144]. A helpful tool for cancer survivors could be a cancer survivorship care plan, as mandated by the American College of Surgeons, which helps breast cancer survivors organize and remember their appointments and testing [145,214]. Which components of the care plan are most helpful and how to deliver them without interference to the clinical flow are yet to be determined [146,147]. Ideally, a

treatment summary and care plan should be part of survivors' electronic medical record, allowing easy access to survivors (e.g., via access to a patient portal) and their providers. The pediatric field has made large strides by creating an online resource with a wealth of information for both providers and survivors that can be easily adjusted as new evidence becomes available, without needing to reach out via mail or in person (e.g., Passport for Care ^[148]). Ideally, a subspecialty medical home concept ^[149–151] would allow remote monitoring of the performance of health maintenance and cancer screening. Additionally, it would allow remote monitoring for more cancer-specific measures, such as cancer surveillance and healthcare utilization, and trigger supportive care services in situations of suboptimal performance.

To summarize, cancer survivorship care is a field that has gained recognition and is in need of a revolution to allow better care for a larger number of survivors in a financially sustainable manner. Therefore, it is crucial to prioritize funding for prospective observational studies (with translational components) to increase our understanding of changes of symptoms and their contributors over time, as well as studies that test the efficacy and effectiveness of supportive care strategies that address both survivor- and provider-related factors. Among the latter, there is a clear need for head-to-head comparisons of various combinations of pharmacological agents and nonpharmacological therapies, including specific health behavior-related interventions, and how these combinations would affect QoL and healthcare utilization.

Acknowledgments

The authors would like to thank Ms A Cardy for her crucial contributions towards text editing.

References

1. Twombly R. What's in a name: who is a cancer survivor? J Natl Cancer Inst. 2004; 96(19):1414–1415. [PubMed: 15467027]
2. Siegel R, Desantis C, Virgo K, et al. Cancer treatment and survivorship statistics, 2012. CA Cancer J Clin. 2012; 62(4):220–241. [PubMed: 22700443]
3. Burstein HJ, Prestrud AA, Seidenfeld J, et al. American Society of Clinical Oncology clinical practice guideline: update on adjuvant endocrine therapy for women with hormone receptor-positive breast cancer. J Clin Oncol. 2010; 28(23):3784–3796. [PubMed: 20625130]
4. Miller AH, Ancoli-Israel S, Bower JE, Capuron L, Irwin MR. Neuroendocrine-immune mechanisms of behavioral comorbidities in patients with cancer. J Clin Oncol. 2008; 26(6):971–982. [PubMed: 18281672]
5. Deprez S, Amant F, Smeets A, et al. Longitudinal assessment of chemotherapy-induced structural changes in cerebral white matter and its correlation with impaired cognitive functioning. J Clin Oncol. 2012; 30(3):274–281. [PubMed: 22184379]
6. Hanchate AD, Clough-Gorr KM, Ash AS, Thwin SS, Silliman RA. Longitudinal patterns in survival, comorbidity, healthcare utilization and quality of care among older women following breast cancer diagnosis. J Gen Intern Med. 2010; 25(10):1045–1050. [PubMed: 20532657]
7. Kim HJ, Barsevick AM, Beck SL, Dudley W. Clinical subgroups of a psychoneurologic symptom cluster in women receiving treatment for breast cancer: a secondary analysis. Oncol Nurs Forum. 2012; 39(1):E20–E30. [PubMed: 22201665]
8. Berger AM, Visovsky C, Hertzog M, Holtz S, Loberiza FR Jr. Usual and worst symptom severity and interference with function in breast cancer survivors. J Support Oncol. 2012; 10(3):112–118. [PubMed: 22277573]
9. Chlebowski RT, Geller ML. Adherence to endocrine therapy for breast cancer. Oncology. 2006; 71(1–2):1–9. [PubMed: 17344666]
10. Lin JH, Zhang SM, Manson JE. Predicting adherence to tamoxifen for breast cancer adjuvant therapy and prevention. Cancer Prev Res (Phila). 2011; 4(9):1360–1365. [PubMed: 21893499]

11. Hershman DL, Kushi LH, Shao T, et al. Early discontinuation and nonadherence to adjuvant hormonal therapy in a cohort of 8,769 early-stage breast cancer patients. *J Clin Oncol.* 2010; 28(27):4120–4128. [PubMed: 20585090]
12. Ruddy K, Mayer E, Partridge A. Patient adherence and persistence with oral anticancer treatment. *CA Cancer J Clin.* 2009; 59(1):56–66. [PubMed: 19147869]
13. Fink AK, Gurwitz J, Rakowski W, Guadagnoli E, Silliman RA. Patient beliefs and tamoxifen discontinuance in older women with estrogen receptor-positive breast cancer. *J Clin Oncol.* 2004; 22(16):3309–3315. [PubMed: 15310774]
14. Lash TL, Fox MP, Westrup JL, Fink AK, Silliman RA. Adherence to tamoxifen over the five-year course. *Breast Cancer Res Treat.* 2006; 99(2):215–220. [PubMed: 16541307]
15. Ziller V, Kalder M, Albert US, et al. Adherence to adjuvant endocrine therapy in postmenopausal women with breast cancer. *Ann Oncol.* 2009; 20(3):431–436. [PubMed: 19150950]
16. Hershman DL, Shao T, Kushi LH, et al. Early discontinuation and non-adherence to adjuvant hormonal therapy are associated with increased mortality in women with breast cancer. *Breast Cancer Res Treat.* 2011; 126(2):529–537. [PubMed: 20803066]
17. Ganz PA, Desmond KA, Leedham B, Rowland JH, Meyerowitz BE, Belin TR. Quality of life in long-term, disease-free survivors of breast cancer: a follow-up study. *J Natl Cancer Inst.* 2002; 94(1):39–49. [PubMed: 11773281]
18. Ganz PA, Coscarelli A, Fred C, Kahn B, Polinsky ML, Petersen L. Breast cancer survivors: psychosocial concerns and quality of life. *Breast Cancer Res Treat.* 1996; 38(2):183–199. [PubMed: 8861837]
19. Ganz PA, Rowland JH, Desmond K, Meyerowitz BE, Wyatt GE. Life after breast cancer: understanding women's health-related quality of life and sexual functioning. *J Clin Oncol.* 1998; 16(2):501–514. [PubMed: 9469334]
20. Jim HS, Jacobsen PB. Posttraumatic stress and posttraumatic growth in cancer survivorship: a review. *Cancer J.* 2008; 14(6):414–419. [PubMed: 19060607]
21. Mehnert A, Koch U. Psychological comorbidity and health-related quality of life and its association with awareness, utilization, and need for psychosocial support in a cancer register-based sample of long-term breast cancer survivors. *J Psychosom Res.* 2008; 64(4):383–391. [PubMed: 18374737]
22. Kushi LH, Doyle C, McCullough M, et al. American Cancer Society guidelines on nutrition and physical activity for cancer prevention: reducing the risk of cancer with healthy food choices and physical activity. *CA Cancer J Clin.* 2012; 62(1):30–67. [PubMed: 22237782]
23. Bardia A, Arieas ET, Zhang Z, et al. Comparison of breast cancer recurrence risk and cardiovascular disease incidence risk among postmenopausal women with breast cancer. *Breast Cancer Res Treat.* 2012; 131(3):907–914. [PubMed: 22042368]
24. Hurria A, Browner IS, Cohen HJ, et al. Senior adult oncology. *J Natl Compr Canc Netw.* 2012; 10(2):162–209. [PubMed: 22308515]
25. Montazeri A. Quality of life data as prognostic indicators of survival in cancer patients: an overview of the literature from 1982 to 2008. *Health Qual Life Outcomes.* 2009; 7:102. [PubMed: 20030832]
26. Epplein M, Zheng Y, Zheng W, et al. Quality of life after breast cancer diagnosis and survival. *J Clin Oncol.* 2011; 29(4):406–412. [PubMed: 21172892]
27. Calle EE, Rodriguez C, Walker-Thurmond K, Thun MJ. Overweight, obesity, and mortality from cancer in a prospectively studied cohort of U.S. adults. *N Engl J Med.* 2003; 348(17):1625–1638. [PubMed: 12711737]
28. McTiernan A, Irwin M, Vongruenigen V. Weight, physical activity, diet, and prognosis in breast and gynecologic cancers. *J Clin Oncol.* 2010; 28(26):4074–4080. [PubMed: 20644095]
29. Goodwin PJ, Ennis M, Pritchard KI, et al. Insulin- and obesity-related variables in early-stage breast cancer: correlations and time course of prognostic associations. *J Clin Oncol.* 2012; 30(2):164–171. [PubMed: 22162568]
30. Earle CC, Burstein HJ, Winer EP, Weeks JC. Quality of non-breast cancer health maintenance among elderly breast cancer survivors. *J Clin Oncol.* 2003; 21(8):1447–1451. [PubMed: 12697865]

31. Shelby RA, Scipio CD, Somers TJ, Soo MS, Weinfurt KP, Keefe FJ. Prospective study of factors predicting adherence to surveillance mammography in women treated for breast cancer. *J Clin Oncol.* 2012; 30(8):813–819. [PubMed: 22331949]
32. Kwan ML, Kushi LH, Weltzien E, et al. Alcohol consumption and breast cancer recurrence and survival among women with early-stage breast cancer: the life after cancer epidemiology study. *J Clin Oncol.* 2010; 28(29):4410–4416. [PubMed: 20805458]
33. Harris HR, Bergkvist L, Wolk A. Alcohol intake and mortality among women with invasive breast cancer. *Br J Cancer.* 2012; 106(3):592–595. [PubMed: 22215064]
34. Giovannucci EL. Physical activity as a standard cancer treatment. *J Natl Cancer Inst.* 2012; 104(11):797–799. [PubMed: 22570316]
35. Narod SA. Alcohol and risk of breast cancer. *JAMA.* 2011; 306(17):1920–1921. [PubMed: 22045772]
36. Eakin EG, Youlden DR, Baade PD, et al. Health behaviors of cancer survivors: data from an Australian population-based survey. *Cancer Causes Control.* 2007; 18(8):881–894. [PubMed: 17638108]
37. Bellizzi KM, Rowland JH, Jeffery DD, McNeel T. Health behaviors of cancer survivors: examining opportunities for cancer control intervention. *J Clin Oncol.* 2005; 23(34):8884–8893. [PubMed: 16314649]
38. Stout NL, Andrews K, Binkley JM, Schmitz KH, Smith RA. Stakeholder perspectives on dissemination and implementation of a prospective surveillance model of rehabilitation for breast cancer treatment. *Cancer.* 2012; 118(8 Suppl):2331–2334. [PubMed: 22488707]
39. Chopra I, Kamal KM. A systematic review of quality of life instruments in long-term breast cancer survivors. *Health Qual Life Outcomes.* 2012; 10:14. [PubMed: 22289425]
40. Ganz, PA. *Cancer Survivorship: Today and Tomorrow.* Springer; NY, USA: 2007.
41. Hickey M, Saunders C, Partridge A, Santoro N, Joffe H, Stearns V. Practical clinical guidelines for assessing and managing menopausal symptoms after breast cancer. *Ann Oncol.* 2008; 19(10):1669–1680. [PubMed: 18522932]
42. Stearns V, Hayes DF. Approach to menopausal symptoms in women with breast cancer. *Curr Treat Options Oncol.* 2002; 3(2):179–190. [PubMed: 12057081]
43. Hickey M, Emery LI, Gregson J, Doherty DA, Saunders CM. The multidisciplinary management of menopausal symptoms after breast cancer: a unique model of care. *Menopause.* 2010; 17(4):727–733. [PubMed: 20512079]
44. Hewitt, M.; Greenfield, S.; Stovall, E., editors. *Institute of Medicine, National Cancer Policy Board. From Cancer Patient to Cancer Survivor: Lost in Transition.* The National Academic Press; Washington, DC, USA: 2006.
45. DeSantis C, Siegel R, Bandi P, Jemal A. Breast cancer statistics, 2011. *CA Cancer J Clin.* 2011; 61(6):409–418. [PubMed: 21969133]
46. Schmitz KH, Cappola AR, Stricker CT, Sweeney C, Norman SA. The intersection of cancer and aging: establishing the need for breast cancer rehabilitation. *Cancer Epidemiol Biomarkers Prev.* 2007; 16(5):866–872. [PubMed: 17507607]
47. Nguyen J, Cramarossa G, Bruner D, et al. A literature review of symptom clusters in patients with breast cancer. *Expert Rev Pharmacoecon Outcomes Res.* 2011; 11(5):533–539. [PubMed: 21958098]
48. Berger AM, Visovsky C, Hertzog M, Holtz S, Loberiza FR Jr. Usual and worst symptom severity and interference with function in breast cancer survivors. *J Support Oncol.* 2012; 10(3):112–118. [PubMed: 22277573]
49. Mohile SG, Fan L, Reeve E, et al. Association of cancer with geriatric syndromes in older Medicare beneficiaries. *J Clin Oncol.* 2011; 29(11):1458–1464. [PubMed: 21402608]
50. Yabroff KR, Lawrence WF, Clauser S, Davis WW, Brown ML. Burden of illness in cancer survivors: findings from a population-based national sample. *J Natl Cancer Inst.* 2004; 96(17):1322–1330. [PubMed: 15339970]
51. Inouye SK, Studenski S, Tinetti ME, Kuchel GA. Geriatric syndromes: clinical, research, and policy implications of a core geriatric concept. *J Am Geriatr Soc.* 2007; 55(5):780–791. [PubMed: 17493201]

52. Cheung WY, Neville BA, Earle CC. Associations among cancer survivorship discussions, patient and physician expectations, and receipt of follow-up care. *J Clin Oncol.* 2010; 28(15):2577–2583. [PubMed: 20406932]
53. Resnick NM, Marcantonio ER. How should clinical care of the aged differ? *Lancet.* 1997; 350(9085):1157–1158. [PubMed: 9343515]
54. Karlamangla A, Tinetti M, Guralnik J, Studenski S, Wetle T, Reuben D. Comorbidity in older adults: nosology of impairment, diseases, and conditions. *J Gerontol A Biol Sci Med Sci.* 2007; 62(3):296–300. [PubMed: 17389727]
55. Quinlan N, Marcantonio ER, Inouye SK, Gill TM, Kamholz B, Rudolph JL. Vulnerability: the crossroads of frailty and delirium. *J Am Geriatr Soc.* 2011; 59(Suppl 2):S262–S268. [PubMed: 22091571]
56. Schilder CM, Seynaeve C, Beex LV, et al. Effects of tamoxifen and exemestane on cognitive functioning of postmenopausal patients with breast cancer: results from the neuropsychological side study of the tamoxifen and exemestane adjuvant multinational trial. *J Clin Oncol.* 2010; 28(8): 1294–1300. [PubMed: 20142601]
57. Schilder CM, Seynaeve C, Linn SC, et al. Cognitive functioning of postmenopausal breast cancer patients before adjuvant systemic therapy, and its association with medical and psychological factors. *Crit Rev Oncol Hematol.* 2010; 76(2):133–141. [PubMed: 20036141]
58. Small BJ, Rawson KS, Walsh E, et al. Catechol-*O*-methyltransferase genotype modulates cancer treatment-related cognitive deficits in breast cancer survivors. *Cancer.* 2011; 117(7):1369–1376. [PubMed: 21425136]
59. Asher A. Cognitive dysfunction among cancer survivors. *Am J Phys Med Rehabil.* 2011; 90(5 Suppl 1):S16–S26. [PubMed: 21765260]
60. Weinberger T, Forrester A, Markov D, Chism K, Kunkel EJ. Women at a dangerous intersection: diagnosis and treatment of depression and related disorders in patients with breast cancer. *Psychiatr Clin North Am.* 2010; 33(2):409–422. [PubMed: 20385344]
61. Somerset W, Stout SC, Miller AH, Musselman D. Breast cancer and depression. *Oncology.* 2004; 18(8):1021–1034. discussion 1035–1026, 1047–1028. [PubMed: 15328896]
62. Fong DY, Ho JW, Hui BP, et al. Physical activity for cancer survivors: meta-analysis of randomised controlled trials. *BMJ.* 2012; 344:e70. [PubMed: 22294757]
63. Cuijpers P, Beekman AT, Reynolds CF 3rd. Preventing depression: a global priority. *JAMA.* 2012; 307(10):1033–1034. [PubMed: 22416097]
64. Dausch BCB, Beckjord E, Luecken L, Anderson-Hanley C, Sherman M, Grossman C. Rates and correlates of DSM-IV diagnoses in women newly diagnosed with breast cancer. *J Clin Psychol Med Settings.* 2004; 11:159–169.
65. Schnatz PF. A multidisciplinary approach to managing menopausal symptoms in women with breast cancer. *Menopause.* 2010; 17(4):680–681. [PubMed: 20632461]
66. Cavalli Kluthe AC, Urbanetz AA, de Carvalho DS, Pereira Maluf EM, Schlickmann Sylvestre GC, Bonatto Hatschbach SB. Fatigue after treatment in breast cancer survivors: prevalence, determinants and impact on health-related quality of life. *Support Care Cancer.* 2011; 20(8):1901–1909. [PubMed: 21994001]
67. Schmidt ME, Chang-Claude J, Vrieling A, Heinz J, Flesch-Janys D, Steindorf K. Fatigue and quality of life in breast cancer survivors: temporal courses and long-term pattern. *J Cancer Surviv.* 2011; 6(1):11–19. [PubMed: 22160661]
68. Goedendorp MM, Andrykowski MA, Donovan KA, et al. Prolonged impact of chemotherapy on fatigue in breast cancer survivors: a longitudinal comparison with radiotherapy-treated breast cancer survivors and noncancer controls. *Cancer.* 2011; 118(15):3833–3841. [PubMed: 22086766]
69. Enderlin CA, Coleman EA, Cole C, Richards KC, Hutchins LF, Sherman AC. Sleep across chemotherapy treatment: a growing concern for women older than 50 with breast cancer. *Oncol Nurs Forum.* 2010; 37(4):A461–A463.
70. Enderlin CA, Coleman EA, Cole C, et al. Subjective sleep quality, objective sleep characteristics, insomnia symptom severity, and daytime sleepiness in women aged 50 and older with nonmetastatic breast cancer. *Oncol Nurs Forum.* 2011; 38(4):E314–E325. [PubMed: 21708527]

71. Berger AM, Gerber LH, Mayer DK. Cancer-related fatigue: implications for breast cancer survivors. *Cancer*. 2012; 118(8 Suppl):2261–2269. [PubMed: 22488700]
72. Hopko DR, Armento ME, Robertson SM, et al. Brief behavioral activation and problem-solving therapy for depressed breast cancer patients: randomized trial. *J Consult Clin Psychol*. 2011; 79(6):834–849. [PubMed: 21988544]
73. Andersen BL, Farrar WB, Golden-Kreutz D, et al. Distress reduction from a psychological intervention contributes to improved health for cancer patients. *Brain Behav Immun*. 2007; 21(7): 953–961. [PubMed: 17467230]
74. Morales L, Pans S, Verschueren K, et al. Prospective study to assess short-term intra-articular and tenosynovial changes in the aromatase inhibitor-associated arthralgia syndrome. *J Clin Oncol*. 2008; 26(19):3147–3152. [PubMed: 18474874]
75. Scarpa R, Atteno M, Peluso R, et al. Rheumatic complaints in women taking aromatase inhibitors for treatment of hormone-dependent breast cancer. *J Clin Rheumatol*. 2011; 17(4):169–172. [PubMed: 21617557]
76. Moxley G. Rheumatic disorders and functional disability with aromatase inhibitor therapy. *Clin Breast Cancer*. 2010; 10(2):144–147. [PubMed: 20299320]
77. Bruzzese V, Hassan C, Zullo A, Zampa G. Rheumatoid arthritis: a complication of aromatase inhibitor therapy? *Int J Immunopathol Pharmacol*. 2011; 24(4):1099–1101. [PubMed: 22230418]
78. Dent SF, Gaspo R, Kissner M, Pritchard KI. Aromatase inhibitor therapy: toxicities and management strategies in the treatment of postmenopausal women with hormone-sensitive early breast cancer. *Breast Cancer Res Treat*. 2011; 126(2):295–310. [PubMed: 21249443]
79. Chlebowski RT. Aromatase inhibitor-associated arthralgias. *J Clin Oncol*. 2009; 27(30):4932–4934. [PubMed: 19752332]
80. Burstein HJ. Aromatase inhibitor-associated arthralgia syndrome. *Breast*. 2007; 16(3):223–234. [PubMed: 17368903]
81. Sestak I, Cuzick J, Sapunar F, et al. Risk factors for joint symptoms in patients enrolled in the ATAC trial: a retrospective, exploratory analysis. *Lancet Oncol*. 2008; 9(9):866–872. [PubMed: 18703382]
82. Mao JJ, Stricker C, Bruner D, et al. Patterns and risk factors associated with aromatase inhibitor-related arthralgia among breast cancer survivors. *Cancer*. 2009; 115(16):3631–3639. [PubMed: 19517460]
83. Henry NL, Azzouz F, Desta Z, et al. Predictors of aromatase inhibitor discontinuation as a result of treatment-emergent symptoms in early-stage breast cancer. *J Clin Oncol*. 2012; 30(9):936–942. [PubMed: 22331951]
84. Tilley A, Thomas-Maclean R, Kwan W. Lymphatic cording or axillary web syndrome after breast cancer surgery. *Can J Surg*. 2009; 52(4):E105–E106. [PubMed: 19680494]
85. Bergmann A, Mendes VV, de Almeida Dias R, do Amaral ESB, da Costa Leite Ferreira MG, Fabro EA. Incidence and risk factors for axillary web syndrome after breast cancer surgery. *Breast Cancer Res Treat*. 2011; 131(3):987–992. [PubMed: 21987036]
86. Beckjord E, Campas BE. Sexual quality of life in women with newly diagnosed breast cancer. *J Psychosoc Oncol*. 2007; 25(2):19–36. [PubMed: 17613483]
87. Krychman ML, Katz A. Breast cancer and sexuality: multi-modal treatment options (CME). *J Sex Med*. 2012; 9(1):5–13. [PubMed: 22151953]
88. Carter J, Goldfrank D, Schover LR. Simple strategies for vaginal health promotion in cancer survivors. *J Sex Med*. 2011; 8(2):549–559. [PubMed: 20722792]
89. Committee on Practice Bulletins-Gynecology. ACOG Practice Bulletin no 126: Management of gynecologic issues in women with breast cancer. *Obstet Gynecol*. 2012; 119(3):666–682. [PubMed: 22353976]
90. Pruthi S, Simon JA, Early AP. Current overview of the management of urogenital atrophy in women with breast cancer. *Breast J*. 2011; 17(4):403–408. [PubMed: 21645165]
91. Donovan KA, Boyington AR, Ismail-Khan R, Wyman JF. Urinary symptoms in breast cancer: a systematic review. *Cancer*. 2012; 118(3):582–593. [PubMed: 21751193]
92. VanderWalde A, Hurria A. Aging and osteoporosis in breast and prostate cancer. *CA Cancer J Clin*. 2011; 61(3):139–156. [PubMed: 21543824]

93. Mirza FS. Management of bone disease in patients undergoing hormonal therapy for breast cancer. *Endocrinol Metab Clin North Am.* 2011; 40(3):549–562. viii. [PubMed: 21889720]
94. Brufsky AM. The evolving role of bone-conserving therapy in patients with breast cancer. *Semin Oncol.* 2010; 37(Suppl 1):S12–S19. [PubMed: 20682367]
95. Gralow JR, Biermann JS, Farooki A, et al. NCCN Task Force Report: Bone health in cancer care. *J Natl Compr Canc Netw.* 2009; 7(Suppl 3):S1–S32. quiz S33–S35. [PubMed: 19555589]
96. Lee BL, Higgins MJ, Goss PE. Denosumab and the current status of bone-modifying drugs in breast cancer. *Acta Oncol.* 2012; 51(2):157–167. [PubMed: 22150116]
97. Aapro MS, Coleman RE. Bone health management in patients with breast cancer: current standards and emerging strategies. *Breast.* 2012; 21(1):8–19. [PubMed: 21958673]
98. Bolland MJ, Grey A, Avenell A, Gamble GD, Reid IR. Calcium supplements with or without vitamin D and risk of cardiovascular events: reanalysis of the Women's Health Initiative limited access dataset and meta-analysis. *BMJ.* 2011; 342:d2040. [PubMed: 21505219]
99. Schmitz KH, Prosnitz RG, Schwartz AL, Carver JR. Prospective surveillance and management of cardiac toxicity and health in breast cancer survivors. *Cancer.* 2012; 118(8 Suppl):2270–2276. [PubMed: 22488701]
100. Archer DF. Premature menopause increases cardiovascular risk. *Climacteric.* 2009; 12(Suppl 1):26–31. [PubMed: 19811237]
101. Shuster LT, Rhodes DJ, Gostout BS, Grossardt BR, Rocca WA. Premature menopause or early menopause: long-term health consequences. *Maturitas.* 2010; 65(2):161–166. [PubMed: 19733988]
102. Cuppone F, Bria E, Verma S, et al. Do adjuvant aromatase inhibitors increase the cardiovascular risk in postmenopausal women with early breast cancer? Meta-analysis of randomized trials. *Cancer.* 2008; 112(2):260–267. [PubMed: 18041059]
103. Macis D, Gandini S, Guerrieri-Gonzaga A, et al. prognostic effect of circulating adiponectin in a randomized 2 × 2 trial of low-dose tamoxifen and fenretinide in premenopausal women at risk for breast cancer. *J Clin Oncol.* 2012; 30(2):151–157. [PubMed: 22162577]
104. Chlebowski RT. Obesity and breast cancer outcome: adding to the evidence. *J Clin Oncol.* 2012; 30(2):126–128. [PubMed: 22162565]
105. Nilsson G, Holmberg L, Garmo H, et al. Distribution of coronary artery stenosis after radiation for breast cancer. *J Clin Oncol.* 2011; 30(4):380–386. [PubMed: 22203772]
106. Blaes AH, Kreitzer MJ, Torkelson C, Haddad T. Nonpharmacologic complementary therapies in symptom management for breast cancer survivors. *Semin Oncol.* 2011; 38(3):394–402. [PubMed: 21600369]
107. Shulman LN, Jacobs LA, Greenfield S, et al. Cancer care and cancer survivorship care in the United States: will we be able to care for these patients in the future? *J Oncol Pract.* 2009; 5(3):119–123. [PubMed: 20856750]
108. Campbell MK, Tessaro I, Gellin M, et al. Adult cancer survivorship care: experiences from the LIVESTRONG centers of excellence network. *J Cancer Surviv.* 2011; 5(3):271–282. [PubMed: 21553353]
109. Ganz PA. The 'three Ps' of cancer survivorship care. *BMC Med.* 2011; 9:14. [PubMed: 21310037]
110. Cheung WY, Neville BA, Cameron DB, Cook EF, Earle CC. Comparisons of patient and physician expectations for cancer survivorship care. *J Clin Oncol.* 2009; 27(15):2489–2495. [PubMed: 19332716]
111. Kantsiper M, McDonald EL, Geller G, Shockney L, Snyder C, Wolff AC. Transitioning to breast cancer survivorship: perspectives of patients, cancer specialists, and primary care providers. *J Gen Intern Med.* 2009; 24(Suppl 2):S459–S466. [PubMed: 19838851]
112. Mao JJ, Bowman MA, Stricker CT, et al. Delivery of survivorship care by primary care physicians: the perspective of breast cancer patients. *J Clin Oncol.* 2009; 27(6):933–938. [PubMed: 19139437]
113. Potosky AL, Han PK, Rowland J, et al. Differences between primary care physicians' and oncologists' knowledge, attitudes and practices regarding the care of cancer survivors. *J Gen Intern Med.* 2011; 26(12):1403–1410. [PubMed: 21785923]

114. Mayer EL, Gropper AB, Neville BA, et al. Breast cancer survivors' perceptions of survivorship care options. *J Clin Oncol*. 2012; 30(2):158–163. [PubMed: 22162585]
115. Cooper JM, Loeb SJ, Smith CA. The primary care nurse practitioner and cancer survivorship care. *J Am Acad Nurse Pract*. 2010; 22(8):394–402. [PubMed: 20670264]
116. Irwin M, Klemp JR, Glennon C, Frazier LM. Oncology nurses' perspectives on the state of cancer survivorship care: current practice and barriers to implementation. *Oncol Nurs Forum*. 2011; 38(1):E11–E19. [PubMed: 21186147]
117. Grant M, Economou D, Ferrell BR. Oncology nurse participation in survivorship care. *Clin J Oncol Nurs*. 2010; 14(6):709–715. [PubMed: 21112849]
118. Pratt-Chapman M, Simon MA, Patterson AK, Risendal BC, Patierno S. Survivorship navigation outcome measures: a report from the ACS patient navigation working group on survivorship navigation. *Cancer*. 2011; 117(15 Suppl):3575–3584. [PubMed: 21780092]
119. Lewis R, Neal RD, Williams NH, et al. Nurse-led vs conventional physician-led follow-up for patients with cancer: systematic review. *J Adv Nurs*. 2009; 65(4):706–723. [PubMed: 19278415]
120. Howell D, Hack TF, Oliver TK, et al. Models of care for post-treatment follow-up of adult cancer survivors: a systematic review and quality appraisal of the evidence. *J Cancer Surviv*. 2012 (Epub ahead of print). 10.1007/s11764-012-0232-z
121. Marcus AC, Garrett KM, Cella D, et al. Can telephone counseling post-treatment improve psychosocial outcomes among early stage breast cancer survivors? *Psychooncology*. 2010; 19(9): 923–932. [PubMed: 19941285]
122. Wang CJ, Huang AT. Integrating technology into health care: what will it take? *JAMA*. 2012; 307(6):569–570. [PubMed: 22318276]
123. Paskett ED, Harrop JP, Wells KJ. Patient navigation: an update on the state of the science. *CA Cancer J Clin*. 2011; 61(4):237–249. [PubMed: 21659419]
124. Fiscella K, Ransom S, Jean-Pierre P, et al. Patient-reported outcome measures suitable to assessment of patient navigation. *Cancer*. 2011; 117(15 Suppl):3603–3617. [PubMed: 21780095]
125. Stanton AL, Bernaards CA, Ganz PA. The BCPT symptom scales: a measure of physical symptoms for women diagnosed with or at risk for breast cancer. *J Natl Cancer Inst*. 2005; 97(6): 448–456. [PubMed: 15770009]
126. Vodermaier A, Linden W, Siu C. Screening for emotional distress in cancer patients: a systematic review of assessment instruments. *J Natl Cancer Inst*. 2009; 101(21):1464–1488. [PubMed: 19826136]
127. Stout NL, Binkley JM, Schmitz KH, et al. A prospective surveillance model for rehabilitation for women with breast cancer. *Cancer*. 2012; 118(8 Suppl):2191–2200. [PubMed: 22488693]
128. Schmitz KH, Stout NL, Andrews K, Binkley JM, Smith RA. Prospective evaluation of physical rehabilitation needs in breast cancer survivors: a call to action. *Cancer*. 2012; 118(8 Suppl): 2187–2190. [PubMed: 22488692]
129. Alfano CM, Ganz PA, Rowland JH, Hahn EE. Cancer survivorship and cancer rehabilitation: revitalizing the link. *J Clin Oncol*. 2012; 30(9):904–906. [PubMed: 22355063]
130. Jacobsen PB, Wagner LI. A new quality standard: the integration of psychosocial care into routine cancer care. *J Clin Oncol*. 2012; 30(11):1154–1159. [PubMed: 22412134]
131. Krebber AM, Leemans CR, de Bree R, et al. Stepped care targeting psychological distress in head and neck and lung cancer patients: a randomized clinical trial. *BMC Cancer*. 2012; 12(1):173. [PubMed: 22574757]
132. Basen-Engquist K, Carmack C, Blalock J, Baum G, Rahming W, Demark-Wahnefried W. Predictors of cancer survivors' receptivity to lifestyle behavior change interventions. *Cancer Epidemiol Biomarkers Prev*. 2012 (Epub ahead of print). 10.1158/1055-9965.EPI-12-0076
133. Beckjord EB, Reches R, Nutt S, Shulman L, Hesse BW. What do people affected by cancer think about electronic health information exchange? Results from the 2010 LIVESTRONG Electronic Health Information Exchange Survey and the 2008 Health Information National Trends Survey. *J Oncol Pract*. 2011; 7(4):237–241. [PubMed: 22043188]
134. Goode AD, Reeves MM, Eakin EG. Telephone-delivered interventions for physical activity and dietary behavior change: an updated systematic review. *Am J Prev Med*. 2012; 42(1):81–88. [PubMed: 22176852]

135. Ottenbacher AJ, Day RS, Taylor WC, et al. Long-term physical activity outcomes of home-based lifestyle interventions among breast and prostate cancer survivors. *Support Care Cancer*. 2012; 20(10):2483–2489. [PubMed: 22249915]
136. Ballard-Barbash R, Friedenreich CM, Courneya KS, Siddiqi SM, McTiernan A, Alfano CM. Physical activity, biomarkers, and disease outcomes in cancer survivors: a systematic review. *J Natl Cancer Inst*. 2012; 104(11):815–840. [PubMed: 22570317]
137. Pierce JP. Diet and breast cancer prognosis: making sense of the Women's Healthy Eating and Living and Women's Intervention Nutrition Study trials. *Curr Opin Obstet Gynecol*. 2009; 21(1): 86–91. [PubMed: 19130632]
138. Schmitz KH, Courneya KS, Matthews C, et al. American College of Sports Medicine roundtable on exercise guidelines for cancer survivors. *Med Sci Sports Exerc*. 2010; 42(7):1409–1426. [PubMed: 20559064]
139. Riegel B, Moser DK, Anker SD, et al. State of the science: promoting self-care in persons with heart failure: a scientific statement from the American Heart Association. *Circulation*. 2009; 120(12):1141–1163. [PubMed: 19720935]
140. Cockle-Hearne J, Faithfull S. Self-management for men surviving prostate cancer: a review of behavioural and psychosocial interventions to understand what strategies can work, for whom and in what circumstances. *Psychooncology*. 2010; 19(9):909–922. [PubMed: 20119934]
141. Wrosch C, Sabiston CM. Goal adjustment, physical and sedentary activity, and well-being and health among breast cancer survivors. *Psychooncology*. 2012 (Epub ahead of print). 10.1002/pon.3037
142. Beekman AT, Smit F, Stek ML, Reynolds CF 3rd, Cuijpers PC. Preventing depression in high-risk groups. *Curr Opin Psychiatry*. 2010; 23(1):8–11. [PubMed: 19901835]
143. Salloum RG, Hornbrook MC, Fishman PA, Ritzwoller DP, O'Keeffe Rossetti MC, Elston Lafata J. Adherence to surveillance care guidelines after breast and colorectal cancer treatment with curative intent. *Cancer*. 2012; 118(22):5644–5651. [PubMed: 22434568]
144. Taplin SH, Clauser S, Rodgers AB, Breslau E, Rayson D. Interfaces across the cancer continuum offer opportunities to improve the process of care. *J Natl Cancer Inst Monogr*. 2010; 2010(40): 104–110. [PubMed: 20386059]
145. Hahn EE, Ganz PA. Survivorship programs and care plans in practice: variations on a theme. *J Oncol Pract*. 2011; 7(2):70–75. [PubMed: 21731511]
146. Grunfeld E, Julian JA, Pond G, et al. Evaluating survivorship care plans: results of a randomized, clinical trial of patients with breast cancer. *J Clin Oncol*. 2011; 29(36):4755–4762. [PubMed: 22042959]
147. Stricker CT, Jacobs LA, Risendal B, et al. Survivorship care planning after the institute of medicine recommendations: how are we faring? *J Cancer Surviv*. 2011; 5(4):358–370. [PubMed: 21968543]
148. Horowitz ME, Fordis M, Krause S, McKellar J, Poplack DG. Passport for Care: implementing the survivorship care plan. *J Oncol Pract*. 2009; 5(3):110–112. [PubMed: 20856747]
149. Greenlee MC, Honsinger R, Kirschner N. The patient-centered medical home neighbor. *Ann Intern Med*. 2011; 154(11):779–780. [PubMed: 21646564]
150. Yee HF Jr. The patient-centered medical home neighbor: a subspecialty physician's view. *Ann Intern Med*. 2011; 154(1):63–64. [PubMed: 21200042]
151. Sinsky CA. The patient-centered medical home neighbor: a primary care physician's view. *Ann Intern Med*. 2011; 154(1):61–62. [PubMed: 21200041]

Websites

201. National Cancer Institute. About cancer survivorship research: survivorship definitions. <http://cancercontrol.cancer.gov/ocs/definitions.html>
202. Cancer.Net. About survivorship. 2012. www.cancer.net/patient/Survivorship/About+Survivorship
203. CDC. Cancer survivors – United States. 2007. www.cdc.gov/mmwr/preview/mmwrhtml/mm6009a1.htm

204. LIVESTRONG report. “I learned to live with it” is not good enough: challenges reported by post-treatment cancer survivors in the LIVESTRONG surveys www.livestrong.org/pdfs/3-0/LSSurvivorSurveyReport_final
205. ACSM/ACS certified cancer exercise trainerSM. <http://certification.acsm.org/acsm-cancerexercise-trainer>
206. Bone Source. NOF Clinician’s guide to prevention and treatment of osteoporosis. www.nof.org/professionals/clinicalguidelines
207. National Cancer Institute. Calcium and cancer prevention: strengths and limits of the evidence. www.cancer.gov/cancertopics/factsheet/prevention/calcium
208. FRAX[®] calculator. www.shef.ac.uk/FRAX
209. Rechis, R.; Beckjord, EB.; Arvey, SR.; Reynolds, KA.; McGoldrick, D. The essential elements of survivorship care: a LIVESTRONG brief. www.livestrong.org/pdfs/3-0/EssentialElementsBrief
210. CMS.gov. Accountable care organizations (ACO). www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ACO/index.html?redirect=/ACO
211. FACIT.org. Questionnaires. www.facit.org/FACITOrg/Questionnaires
212. LIVESTRONG at the YMCA. www.livestrong.org/What-We-Do/Our-Actions/Programs-Partnerships/LIVESTRONG-at-the-YMCA
213. ACS. ACS guidelines on nutrition and physical activity for cancer prevention. <http://tinyurl.com/c2o77re>
214. American College of Surgeons. Cancer program standards 2012, version 1.1: ensuring patient-centered care. www.facs.org/cancer/coc/programstandards2012.html

Practice Points

- Evidence suggests that breast cancer survivors' outcomes are determined by multiple factors, including tumor characteristics, positive and negative effects of cancer treatments and health behaviors.
- Breast cancer survivors should be assessed and managed for physical and emotional symptoms simultaneously.
- As multiple factors can contribute to their health, management of breast cancer survivors requires a multidisciplinary approach that includes nonpharmacological treatment options, such as physical, psychological or nutritional therapy, and complementary medicine, in addition to pharmacological treatment.
- Novel, cost-effective and reproducible supportive care strategies for breast cancer survivors need to be developed.

Figure 1. Prevalence of post-cancer-onset physical and emotional concerns in breast cancer survivors

Reproduced with permission from [204].

Figure 2.
Determinants of cancer survivors' outcomes.