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Lower Gastrointestinal Cancers (AB Benson, Section Editor)

Survivorship Guidance for Patients with Colorectal Cancer

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Opinion statement

Effective therapy for treatment of colorectal cancer includes comprehensive and evidence-based therapies that may include a combination of surgery, chemotherapy, targeted therapy, and/or radiation. However, in order to provide patients with the highest quality of care, providers must consider all aspects of survivorship care including: surveillance for recurrence/second primaries, genetic counseling, psychosocial/physical late effects of cancer and its therapies, and preventative lifestyle strategies. Health systems, providers, and researchers need to identify systematic methods of addressing the unique needs of the survivorship population that include multidisciplinary teams including supportive oncology (i.e., psychologists, social workers), specialties (i.e., cardiology), and primary care physicians.

Introduction

Colorectal cancer is the second and third most common cancer among male and female survivors, respectively, and there are estimated to be over one million colorectal cancer (CRC) survivors in the USA alone [1]. The majority of these survivors are aged 60 years or older. In addition to (and perhaps compounding) the usual effects of aging, these survivors are at risk for various long-term or late effects of cancer and/or cancer treatment, including recurrence, new cancers, and the physical and

psychosocial complications of chemotherapy, radiation, and surgery. This review will discuss each of these in depth, as well as strategies for secondary CRC prevention.

Epidemiology

According to the American Cancer Society (ACS) [2], the overall 5-year survival rate for CRC is 65%. Patients that presented with localized or regional disease have an even better prognosis, with rates as high as 90 and 71%, respectively. In general, the incidence of CRC has been decreasing. This is thought to be the result of more widespread screening [2]. Interestingly, this trend does not apply to those under age 50. According to data from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program, there has been a 51% increase in young onset colorectal cancer incidence within the 20–49 age group since 1994 [3]. Based on current trends, in 2030, the incidence rates for colon and rectal cancers will increased by 90.0 and 124.3%, respectively, for patients 20–49 years and by 27.7 and 46.0%, respectively, for patients 35 to 49 years [4]. Further study is needed to determine the cause of these increases and identify efficient strategies for prevention and early detection in the population.

Surveillance for recurrence and screening for second primary malignancies

Surveillance for recurrence

The National Comprehensive Cancer Network (NCCN) [5•, 6•], ACS [7•], and American Society of Clinical Oncology (ACSO) [8] recommend surveillance during the first 5 years after treatment (Tables 1 and 2). All survivors, regardless of stage, should undergo colonoscopy 1 year following resection (or within 3–6 months if the initial colonoscopy was not performed or limited by lumen obstruction). If an advanced (villous polyp, polyp > 1 cm, or high-grade dysplasia) adenoma is found, colonoscopy should be repeated in 1 year; otherwise, colonoscopy can be repeated at 3 years and then every 5 years. Patients with stage II–IV disease should have a history and physical (H&P), serum carcinoembryonic antigen (CEA) level, and proctoscopy plus endoscopic ultrasound (EUS) or magnetic resonance imaging (MRI) (only for rectal cancer not treated with radiation) every 3–6 months for 2 years, then every 6 months for the next 3 years. Finally, CT of the chest, abdomen, and pelvis with intravenous and oral contrast is recommended every 6–12 months for 3–5 years for stages II–III, and every 3–6 months for stage IV disease. The role for routine CEA testing or imaging after 5 years is unclear. These recommendations can serve as a guideline for surveillance, but ultimately a surveillance strategy should be customized and discussed with each individual patient, taking into account their personal preferences, functional status, and overall risk of recurrence.

Screening for secondary cancers

In general, cancer survivors should adhere to the same screening guidelines that apply to asymptomatic, average-risk non-cancer survivors, as set forth by ACS

Table 1. Surveillance for stage I colorectal cancer

Colon and rectal cancer (stage I)						
Intervention	1 year	2 year	3 year	4 year	5 year	6+
Interval history and physical exam	As clinically indicated					
Colonoscopy	Colonoscopy at 1 year after surgery, then …					
	If advanced adenoma, repeat in 1 year			If no advanced adenoma, repeat in 3 years, then every 5 years		

[9]. However, some cancer survivors are at higher-than-average risk for secondary cancers due to a familial cancer syndrome, and this can affect their screening schedule (Table 3). Management of suspected or confirmed familial cancers is discussed in more detail below (see Heritable CRC Syndromes).

There is conflicting data as to whether rectal cancer survivors are at increased risk of second malignancies due to radiation treatment. A 2005 analysis of the Swedish and Uppsala rectal cancer trials indicated that irradiated patients were more likely to develop second cancers within the irradiated field, although the data also suggested that irradiated patients were at lower risk of local rectal cancer recurrence [10]. A 2007 analysis of the SEER registry showed that irradiated patients had a lower risk of developing prostate cancer, but a higher risk of developing uterine and cervical cancers [11]. More recently, analyses of the Dutch TME [12] and several randomized trials conducted in Sweden [13] failed to show any increase in second malignancies in irradiated versus non-irradiated patients. It is worth noting, however, that both irradiated and non-irradiated patients were at increased risk of second cancers compared to the general population [12]; this may be due to genetic or lifestyle factors. Practically speaking, this information need not change an individual's cancer screening schedule, but should remind providers to be especially vigilant for

Table 2. Surveillance for stage II–III colorectal cancer

Colon and Rectal Cancer (Stage II-III)					
Intervention	1 year	2 years	3 years	4 years	5 years
Interval History and physical exam	Every 3–6 months		Every 6 months		
Colonoscopy	Colonoscopy at 1 year after surgery, then …				
	If advanced adenoma, repeat in 1 year			If no advanced adenoma, repeat in 3 years, then every 5 years	
CT chest/abd/pelvis	Every 6–12 months				
CEA	Every 3–6 months			Every 6 months	
Proctoscopy (with EUS or MRI)	Every 3–6 months			Every 6 months	

*For rectal cancer patients treated with transanal excision only)

*Based on Version 4.2018 NCCN Guidelines for Colon Cancer and 3.2018 Rectal Cancer

Table 3. Screening recommendations for patients with lynch syndrome

Lynch syndrome (MLH1, MSH2, MSH6, PMS2, and EPCAM mutation carriers) screening recommendations	
Screening	Intervention and frequency
Risk to relatives	•Advise relatives about possible inherited cancer risk, options for risk assessment, and management. •Recommend genetic counseling and consideration of genetic testing for at-risk relatives
Colon cancer	•Colonoscopy at age 20–25 years or 2–5 years prior to the earliest colon cancer if it is diagnosed before age 25 years and repeat every 1–2 years. •There are data to suggest that aspirin may decrease the risk of colon cancer in LS but optimal dose and duration of aspirin therapy are uncertain.
Gastric and small bowel cancer	•May consider EGD with extended duodenoscopy every 3–5 years: beginning at age 30–35 years old. •Consider testing and treating *H. pylori*
Endometrial and ovarian cancer	•Consider prophylactic hysterectomy/BSO if postmenopausal or childbearing completed. •Educate patients to be aware that dysfunctional vaginal bleeding warrants immediate evaluation. •Consider endometrial sampling every 1–2 years •Transvaginal ultrasound and CA 125 has not been shown to be sufficiently sensitive or specific, can be considered if clinically indicated
Urothelial cancer	•In those with family history or urothelial cancer or MSH2 mutation, urinalysis annually starting at 30–35 years old
Central nervous systems	•Consider physical and neurological exam every year: starting at 25–30 years old
Pancreatic cancer	•Despite data indicating an increased risk for pancreatic cancer, no screening recommendations have been stated.
Breast cancer	•Mammogram per routine screening guidelines based on risk
Reproductive options	For patients of reproductive age •Advise about options for prenatal diagnosis and assisted reproduction including pre-implantation genetic diagnosis. Discussion should include known risks, limitations, and benefits of these technologies. •Advise about the risk of a rare recessive syndrome if both partners are a carrier of a mutation/s in the same MMR gene or EPCAM
One time referral to genetic counselor for genetic counseling.	

*Based on Version 1.2018 NCCN Guidelines for Lynch Syndrome

symptoms such as hematuria, and promptly evaluate any new symptoms concerning for a second malignancy.

Heritable CRC syndromes

Approximately 5–6% of colorectal cancers have germline mutations that are strongly linked with cancer formation [14•]. The most common of the heritable CRC syndromes is hereditary nonpolyposis colorectal cancer (HNPCC or Lynch syndrome), which accounts for about 3% of cases. The hallmark of HNPCC is a

defect in mismatch repair (MMR) proteins that leads to high levels of microsatellite instability (MSI) and subsequent cancer formation. Colorectal (10–82%) and endometrial (15–60%) cancers have the highest prevalence among patients with HNPCC, but these patients are also at risk for cancers of the stomach, ovary, hepatobiliary system and pancreas, urinary tract, small bowel, brain and central nervous system, and sebaceous neoplasms. HNPCC should be suspected in patients with synchronous or metachronous CRC, multiple HNPCC-associated cancers, familial clustering of HNPCC-associated cancers, CRC arising before age 50, and high MSI on tumor testing [15]. Diagnosis is made by identification of a pathogenic germline mutation in the *MMR* or *EPCAM* genes. HNPCC CRC survivors may benefit from more aggressive screening for non-CRC tumors, as detailed in the ASCO and NCCN guidelines [15, 16•] (Table 3).

Physical and psychosocial issues as a result of CRC and its treatment

In general, long-term survivors of colorectal cancer tend to have comparable quality of life (QOL) measures to the general population. Nevertheless, there are several physical and psychosocial factors relevant to survivors that can negatively impact their QOL, including depression, bowel dysfunction, fatigue [17–19]. These and other pertinent physical and psychosocial considerations are discussed in this section.

Bowel symptoms

Long-term bowel dysfunction is common among CRC survivors. Chronic diarrhea is the most prevalent symptom, affecting nearly half of patients [20]. Survivors also report incontinence, increased frequency and urgency, decreased stool and flatus discrimination, rectal bleeding, and incomplete evacuations, especially those who received low anterior resection (LAR) or pelvic radiation [21]. Providers can manage these symptoms the same way as in the general population, and should refer patients with persistent symptoms to a gastroenterologist [7•]. Evidence is limited to support any specific interventions, but lipoamide (Imodium) or diphenoxylate/atropine (Lomotil) may be helpful in treating chronic diarrhea. Patients may also benefit from diets low in fiber, dairy, and fat, or an elemental diet [22]. For fecal incontinence, treatment options include stool bulking agents, biofeedback, and procedural/surgical interventions [23]. A 2014 systematic review demonstrated that pelvic floor rehabilitation may also be useful for improving the functional outcome after a low anterior resection [24].

Urinary symptoms

Stress, urge, and overflow incontinence are all potential short-term and long-term symptoms following surgery or radiation. Potential mechanisms include anatomical changes to the pelvis, autonomic nerve injury, bladder wall injury, or pelvic floor weakening, although the rate of urinary dysfunction in the general population is high and some symptoms may not be attributable to

treatment. Regardless, patients with symptoms persisting beyond the immediate postoperative/post-treatment period should be referred to a urologist for urodynamic studies. Patients with persistent hematuria, especially following radiation, should also be referred for cystoscopy [7•].

Sexual dysfunction and fertility

Both male and female CRC survivors report sexual dysfunction at rates higher than in the general population [25]. The prevalence of symptoms varies across studies, but in one large population-based study men reported higher rates of erectile and ejaculation problems, and women reported higher rates of vaginal dryness and dyspareunia, as well as lower rates of sexual enjoyment [25]. These symptoms tend to be more common in rectal cancer survivors and among patients with ostomies [26]. Sexual dysfunction and dissatisfaction are strongly correlated with psychosocial distress [7•], but patients may be hesitant to discuss their symptoms if unprompted. It is important for providers to specifically ask about sexual health in patients that are either sexually active or inactive. As in the general population, vaginal lubricants or low-dose topical estrogen can be helpful for dryness, phosphodiesterase-5 inhibitors for erectile dysfunction, and counseling for behavioral or emotional factors. Testosterone replacement may be warranted for men with radiation-induced Leydig cell dysfunction [7•].

Pelvic radiation and (to a lesser extent) oxaliplatin can induce gonadal failure, especially in women [27]. Thus, we recommend discussing fertility preservation options with patients of reproductive age prior to starting treatment.

Peripheral neuropathy

Oxaliplatin is one of the most commonly used chemotherapies for CRC, and can cause both acute and chronic peripheral neuropathies. The acute neuropathic syndrome occurs during treatment in approximately 90% patients and typically resolves within days to weeks, but a sizeable subset of patients goes on to develop a chronic sensory peripheral neuropathy that persists for months to years following treatment cessation. Patients most often describe tingling, numbness, or pain in a "stocking glove" distribution that tends to affect the feet more than the hands. Multiple studies have demonstrated that these symptoms can have a profound negative impact on QOL [28, 29]. Unfortunately, robust evidence on treatment options is lacking. Of the available pharmacological agents, duloxetine has the best evidence of efficacy [7•]. Patients with severe or disabling pain can be referred to neurology, pain specialists, or integrative medicine centers for non-pharmacological options like acupuncture and biofeedback. Patients with impaired gait, balance, or stability should be referred for physical therapy.

Cardiovascular disease

A 2018 analysis of the SEER-Medicare database most strongly supports a link between colorectal cancer and cardiovascular disease. 72,408 patients over age 65 (median age 78) who had been treated for stage I to III CRC were compared to matched cohort of 72,408 patients without cancer. Over a median follow-up time of 8 years, the 10-year cumulative incidence of new-onset CVD and CHF

in survivors was 57.4 and 54.5% compared with 22 and 18%, respectively, in the control cohort. The investigators also found that chemotherapy exposure interacted with hypertension and diabetes to increase cardiac risk [30]. Taken together, this suggests that providers should be especially vigilant for new-onset cardiac disease among survivors, especially those with preexisting comorbidities and those that received adjuvant chemotherapy.

Fatigue

Fatigue is one of the most common and bothersome symptoms experienced by survivors. It can persist for several years following treatment, and is associated with high levels of disability [31]. The ACS recommends serial clinical screening for fatigue using a validated instrument such as the MSADI, BFI, FACT-G7, or FACT-C [23]. If time is a constraint, the NCCN notes that the simple question, "How would you rate your fatigue on a scale of 0-10 over the past 7 days," can be valuable. For patients reporting a score of 4 or higher (or with a positive result on one of the validated instruments), non-pharmacological interventions like regular exercise or cognitive behavioral therapy are recommended. Some patients may benefit from methylphenidate or modafinil if all other potential causes and interventions are exhausted, but evidence supporting their use is limited [32••].

Psychological distress, depression, and anxiety

Fear of recurrence and the physical, social, financial, and emotional changes associated with colorectal cancer can lead to high levels of distress among survivors. Patients with ostomies, limited activity levels, and sexual dysfunction seem to be especially susceptible. Studies vary as to whether survivors have higher rates of depression and anxiety compared to the general population. In general, rates tend to decrease as more time passes since diagnosis and treatment [23, 33]. Regardless, regular screening for psychological distress and depression is recommended for all colorectal cancer survivors, along with follow-up to ensure that identified needs were met.

Pelvic fractures

Rectal cancer survivors that received pelvic radiation are at increased risk of pelvic fracture, especially in the setting of other risk factors like female sex, pre-existing osteoporosis, and advanced age [34–36]. Symptoms of pelvic fracture include back pain, decreased mobility, and pelvic pain, which can also mimic cancer recurrence. Evidence does not support pharmacological prophylaxis [37], but we recommend that providers monitor bone mineral density, treat any pre-existing risk factors, and monitor for symptoms suggestive of fracture.

Financial toxicity of CRC and its treatment

Cancer patients are at particular risk for financial burden when compared to persons without cancer [38]. In a study using pooled data from the Medicare Current Beneficiary Survey linked to Medicare claims, 50% of elderly patients with a diagnosis of cancer paid at least 10% of their income towards out-of-pocket, cancer-related expenses [39]. In a sample from the 2001 to 2008 Medical Expenditure Panel Survey (MEPS), non-elderly patients with cancer

reported higher out-of-pocket cost burden (defined as spending more than 20% of their income on health) when compared to patients with and without other chronic illnesses (13.4%, 9.7%, and 4.4% respectively) [40]. Cost sharing for cancer patients can lead to the inability to afford basic needs such as food and clothes [41–44], non-adherence [38, 41, 42, 45], spending savings [43], and even bankruptcy [41, 46]. Approximately a quarter of patients with early stage colorectal cancer in a study by Shankaran et al. were in debt due to treatment-related expenses, and those patients reported a mean debt of $26,860 [47].

Previous studies have explored predictors of increased financial burden, and those that appear to be vulnerable subgroups include racial and ethnic minorities, younger age, lower annual household income, less than a college degree, unemployment, and Medicaid insurance [47–49]. In a study of patients receiving chemotherapy for colorectal cancer specifically, younger patients and those with lower household income were predisposed to experience greater financial burden [47]. In addition to direct cost of care, a cancer diagnosis can impact a patient's employment status or increase work limitations due to symptoms, treatment, or any medical complications [50–56]. In a study from the National Health Interview Survey (NHIS), increased financial burden as a result of cancer care costs was the strongest independent predictor of poor quality of life among cancer survivors [57].

Secondary prevention strategies

A number of dietary, behavioral, and pharmacologic strategies have been investigated for secondary prevention of CRC. While large, randomized studies of secondary prevention strategies are generally lacking, a number of low-risk interventions are worth considering.

Diet

General dietary pattern appears to play a role in risk of CRC recurrence. "Western" diets that are high in red and processed meats, processed sweets, and refined grains have been shown to negatively impact disease-free survival (DFS). In one study of 1009 patients with stage III colon cancer, those in the highest quintile for Western diet consumption had a higher risk of recurrence (HR 2.85, 95% CI 1.75–4.63) and death (HR 2.32, 95% CI 1.36–3.96) compared to those in the lowest quintile [58]. Interestingly, following a "prudent" diet high in fruits, vegetables, fish, poultry, and whole grains did not affect recurrence risk or mortality. Patients in the highest quintile for dietary glycemic load were also at higher risk for recurrence compared to those in the lowest quintile (HR for DFS 1.79, 95% CI 1.29–2.48). When stratified by body mass index (BMI), higher glycemic load was associated with higher recurrence risk in the overweight and obese population (HR 2.26, 95% CI 1.53–3.32), but not in normal BMI patients [59]. Another observational study of 529 patients with CRC showed that patients in the highest quartile for processed meat consumption had higher recurrence risk compared to patients in the lowest quartile (HR 1.82, 95% CI 1.07–3.09). Worsened overall survival was also observed with high processed meat consumption in colon cancer patients only (highest vs the lowest quartile: HR 2.13, 95% CI 1.03–4.43) [60].

Body weight

The relationship between body weight and CRC recurrence risk is complex and requires further study to be clearly defined. One population-based cohort study of 3408 patients with stage I to III CRC showed that extremes of weight [underweight with BMI < 18.5 kg/m^2 and classes II and III obesity (BMI ≥ 35 kg/m^2)] were associated with worse all-cause mortality. Conversely, patients who were high-normal weight (BMI 23 to < 25 kg/m^2) and overweight (BMI 25 to < 30 kg/m^2) had lower all-cause mortality compared to patients with low-normal weight (BMI 18.5 to < 23 kg/m^2). Patients with class I obesity (BMI 30 to < 35 kg/m^2) showed no difference in risk compared to normal weight patients [61]. The biological basis for this variation is unclear.

The Cancer Prevention Study-II Nutrition study included 2303 non-metastatic CRC patients and showed that pre-diagnosis obesity compared with normal BMI was associated with higher risk of mortality from all causes [relative risk (RR), 1.30; 95% CI, 1.06–1.58], CRC (RR, 1.35; 95% CI, 1.01–1.80), and cardiovascular disease (RR, 1.68; 95% CI, 1.07–2.65). Post-diagnosis BMI was not associated with worse all-cause or cause-specific survival [62]. Another cohort study demonstrated that BMI > 35.0 kg/m^2 was associated with an increased risk for recurrence of and death from colon cancer [63]. However, the Cancer and Leukemia Group B (CALGB) 89,803 study did not confirm an association between higher BMI and CRC recurrence or death [64].

While these results are somewhat inconclusive and make it difficult to recommend any weight change after CRC diagnosis, many other malignancies (e.g., postmenopausal breast, renal, pancreas, esophageal, and endometrial carcinoma) are likely associated with overweight and obesity. In an analysis that included 12,000 CRC survivors, those who were overweight were at increased risk of an obesity-related second cancer (HR 1.39, 95% CI 1.01–1.92), as were obese patients (HR 1.47, 95% CI 1.02–2.12) [65].

Exercise

Increased physical activity positively impacts quality of life and functional status and it may reduce CRC-specific and all-cause mortality [66–68]. One observational study of 3797 survivors of CRC demonstrated that both pre-diagnosis and post-diagnosis physical activity ≥ 7 h per week was associated with a 20 and 31% lower all-cause mortality risk, respectively, compared to those who did not exercise. The study also showed that increased pre-diagnosis TV watching ≥ 5 h per day was associated with an increase in all-cause mortality. Higher post-diagnosis TV watching was not associated with increased all-cause mortality, though there was a trend in that direction [69]. A systematic review of six studies confirmed the secondary prevention benefits of exercise for CRC survivors. Three studies showed increased physical activity was associated with reduced risk of CRC-specific mortality, ranging from 43 to 61%. Four studies showed a statistically significant improvement in all-cause mortality associated with post-diagnosis physical activity [66]. The Colon Health and Lifelong Exercise Change (CHALLENGE) trial is a randomized study of stage II and III colon cancer patients randomized to a structured exercise program or to receiving health education materials to evaluate the impact of exercise on CRC secondary prevention [70]. The study is still ongoing.

Aspirin

Perhaps the best secondary prevention data comes for aspirin, acting as a cyclooxygenase 2 (COX-2) inhibitor. This pathway is overexpressed in up to 85% of CRCs [71••]. A randomized trial of 635 patients randomly assigned to receive aspirin 325 mg vs. placebo showed fewer patients in the aspirin arm developed adenomas during post-treatment surveillance (17% vs. 27%, $p = 0.004$). Patients in the aspirin arm also had fewer adenomas and longer time to first adenoma detection [72]. These findings are further supported by a prospective cohort study of 1279 patients with stages I to III CRC. Aspirin use was associated with decreased CRC-specific mortality (HR: 0.71, 95% CI: 0.53–0.95) and decreased all-cause mortality (HR 0.79, 95% CI 0.65–0.97) [73]. Several other observational studies support these findings, though the optimal aspirin dose remains unknown [74–77]. Based on these data, the 2018 NCCN guidelines state recommend practitioners consider aspirin 325 mg for secondary prevention [5•].

Vitamin D

Survivors with higher levels of vitamin D have been shown to have improved CRC-specific and all-cause mortality, but whether vitamin D supplementation can improve survival is still unknown. One prospective cohort study of 1598 patients with stages I to III colon cancer demonstrated that survivors in the highest tertile of vitamin D level had improved CRC-specific mortality (HR 0.68, 95% CI 0.50 to 0.90) and all-cause mortality (HR 0.70, 95% CI 0.55 to 0.89) compared to patients in the lowest tertile [78]. Other observational studies have confirmed these results [79]. However, two observational studies that evaluated vitamin D supplementation (one post-CRC diagnosis, one pre-diagnosis of several cancers, including colon cancer) did not show a recurrence or survival benefit from vitamin D supplementation [80, 81].

In addition to the above, CRC survivors should be encouraged to not smoke and drink alcohol in moderation if they drink or avoid starting alcohol consumption if they do not already [82–84].

Survivorship care planning

For patients diagnosed with colorectal cancer, the transition from active treatment to post-treatment care is critical to long-term health. In 2006, Institute of Medicine's published a landmark report, From Cancer Patient to Cancer Survivor: Lost in Transition, [85••] which highlighted issues including late effects of cancer treatment, lifelong emotional effects and tumor recurrence. The report also outlined healthcare delivery issues such as poor coordination of care, lack of communication between health practitioners and patient uncertainty about who is responsible for providing long-term care.

In light of the IOM's recommendations, over the last decade, there has been a significant push by national organizations and accreditation bodies (i.e., Commission on Cancer) to implement development and delivery of survivorship care plans (SCPs). Randomized controlled data on the outcomes of SCPs have been mixed. Although levels of survivor satisfaction with SCPs are very high, no significant effect was found on survivor distress, satisfaction with care, cancer-care coordination or oncological outcomes in multiple RCTs [86]. One

study suggested a positive impact on reducing unmet needs [87]. Staff resources and lack of reimbursement were identified as a significant barrier to implementation [88]. Despite the mixed results in clinical trials, implementation of SCPs has provided the needed impetus for health systems and providers to address survivorship issues. A shared-care model with primary care, using a risk-stratified approach, optimizes the expertise of both oncologists and primary care physicians and is considered an ideal model of survivorship care [89••].

Compliance with Ethical Standards

Conflict of Interest
The authors declare they have no conflict of interest.

Human and Animal Rights and Informed Consent
This article does not contain any studies with human or animal subjects performed by any of the authors.

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The aim of this publication is to provide a rationale for survivor health care and to articulate a taxonomy of models of survivor care that is applicable to both community practices and academic institutions.

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