

Surveillance and Monitoring of Adult Cancer Survivors

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ABSTRACT

Advances in early detection and treatment have improved survival in common adult cancers. Surveillance for late recurrence and secondary primary malignancies is recommended for most patients. Initial treatment with surgery, radiation, chemotherapy, or hormonal therapy can result in both local and systemic sequelae, including treatment-related new cancers. Patients with head and neck, lung, breast, colorectal, and prostate cancers constitute the largest groups requiring long-term monitoring and follow-up care.

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Improved early diagnosis and treatment have led to enhanced patient survival of many cancers. Approximately 70% of patients with cancer survive 5 years or more, with an estimated 12 million such patients in the United States. Cancer survivors experience long-term sequelae of surgery, chemotherapy, and radiation treatment. They also are at risk for cancer recurrence (usually within 2-3 years of the original diagnosis¹), second primary tumors, and new malignancies related to their initial treatment. There are few data directing long-term monitoring, surveillance, or preventive care for adult cancer survivors.^{2,3}

The National Comprehensive Cancer Network and the American Society of Clinical Oncology recommend follow-up every 3 months during the first 2 years and at 6-month intervals for the subsequent 3 years for most adult cancer survivors. Shared survivorship care plans, in which the roles of the primary care physician, oncologist, and surgeon are explicitly outlined, reduce redundancy and missed treatment opportunities. Providing patients a treatment synopsis⁴ may improve their knowledge of the cancer diagnosis and treatment, facilitate coordination of follow-up visits, and improve overall satisfaction with follow-up care.

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The primary care physician has a key role in caring for cancer survivors. Although outcomes for breast cancer survivors followed by a primary care provider are equivalent to those of patients followed by an oncologist,⁵ the best care is delivered through coordination between the primary care provider and the oncologist.^{6,7}

Specific surveillance and follow-up of cancer survivors depend on the type of primary tumor and the initial treatment rendered. This article will address survivors of the most common adult malignancies: head and neck, lung, breast, colorectum, and prostate.

CARE BASED ON CANCER SITE

Head and Neck Cancer

For patients with head and neck cancer, the most common cause of death 3 or more years after initial treatment is a second primary cancer, because aerodigestive tract cells are similarly affected by the carcinogens (alcohol and tobacco) that contributed to their original malignancy.⁸ Primary second cancers (lung, head and neck, and esophagus) are most likely to occur in current smokers, less likely in former smokers, and rarely in nonsmokers, emphasizing the importance of aggressive smoking cessation efforts.

Patients treated with neck radiation should be closely monitored for hypothyroidism and accelerated carotid atherosclerosis. Although usually detected early, hypothyroidism may not be diagnosed until later because symptoms may mimic common side effects of cancer treatment, such

as depression or fatigue. Measurement of thyroid-stimulating hormone levels (with or without thyroxine levels) every 6 to 12 months is an accepted approach. Accelerated carotid artery atherosclerosis also is common, although routine Doppler ultrasound screening in asymptomatic patients without an audible bruit is not recommended. Whether aggressive hypolipidemic therapy reduces the risk of symptomatic disease is undetermined.

Lung Cancer

Even with a 20-30% 5-year survival, there are approximately 40-60,000 new lung cancer survivors each year. The National Cancer Care Networks recommend a history, physical exam, and chest computed tomography every 4-6 months for the first 2 years, then annually thereafter. Although controversy exists, many experts recommend using computerized tomography (rather than plain radiographs) to screen for a second malignancy; although concerns about radiation risk associated with CT exist.⁹ Patients should only undergo aggressive screening when healthy enough to undergo another curative intent treatment. However, routine use of positron emission tomography (PET) scan or magnetic resonance imaging (MRI) of brain is not indicated.

Patients who have received chemoradiation therapy for lung cancer are at a 2- to 3-fold greater risk of developing cardiovascular disease. Preventive care should focus on smoking cessation, as well as lifestyle modification and other (hypertension, dyslipidemia) treatments to reduce atherosclerotic risk. Table 1 lists common cardiotoxic agents used in cancer therapy.

Respiratory problems are common in lung cancer survivors. Most have underlying chronic obstructive lung disease, and both surgical excision and chemoradiation further compromise pulmonary function. In patients treated with radiation, chest wall malignancies (sarcoma) also should be sought.

Breast Cancer

Breast cancer will develop in approximately 1 in 8 women, whereas more survive with early detection and improved therapy. The American Society of Clinical Oncology recom-

mends follow-up with a history and physical examination every 3 to 6 months for the first 3 years, every 6 to 12 months for the next 2 years, and then once yearly after completing initial treatment. Because breast cancer can recur as locoregional disease or distant metastases, the remaining affected and unaffected breasts should be examined by annual mammography.

Surgical treatment can result in a post-mastectomy pain syndrome or lymphedema. If treatment included radiation, brachial plexopathy, pneumonitis, and second malignancies in the radiation field (including chest wall sarcomas) may occur. Chemotherapy can result in myelosuppression, premature ovarian failure, neuropathy, cardiotoxicity (including from targeted agents such as trastuzumab), and second malignancies. Hormonal therapy risks include endometrial cancer and thrombosis (tamoxifen) and loss of bone density (aromatase inhibitors). Given their high frequency of vitamin D deficiency and lack of estrogen stimulation, these patients should have vitamin D levels monitored, be provided adequate calcium and vitamin D supplementation, and have a baseline bone density scan before treatment initiation. Diet and exercise are important, especially for postmenopausal women, to decrease their risk of breast cancer recurrence.

Long-term survivors are more likely to die of cardiovascular disease than of breast cancer. Studies suggest that older age and preexisting cardiovascular disease predict a higher incidence of later cardiovascular events. Annual echocardiograms or nuclear gated cardiac scans should be considered in high-risk patients, even when asymptomatic. Control of hypertension and dyslipidemia may help reduce cardiotoxicity, and angiotensin-converting enzyme inhibitors, beta-blockers, and regular aerobic exercise also may be beneficial.

Although most breast cancer recurrences occur within 10 years of the initial diagnosis, estrogen receptor-positive disease in particular can recur much later, emphasizing the need for long-term surveillance.

Colorectal Cancer

Between 10% and 50% of patients with surgically treated colorectal cancer will develop recurrence.¹⁰ Surveillance

Table 1 Cancer Treatments Associated with Cardiotoxicity

Class	Drugs	Comments/Disease Site
Anthracyclines	Doxorubicin Daunorubicin Epirubicin	Cumulative dose > 550 mg/m ² Mostly used in breast cancer and leukemia
Cyclophosphamide	Cytoxan	Breast cancer
HER-2 inhibitor	Trastuzumab (Herceptin, Genentech, Inc, South San Francisco, CA) Lapatinib (Tykerb, GlaxoSmithKline, London, UK)	Breast cancer, stomach cancer
Anti-angiogenesis	Bevacizumab (Avastin, Genentech, Inc)	Lung, colorectal, and breast
Radiation therapy	Mediastinal area	Lung and breast

Common group of chemotherapeutic agents that are associated with increased cardiotoxicity. Anthracyclines are the most common agents, and cardiotoxic effects are usually related to the cumulative dose exposed to the patient.

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