Patients with lung cancer have high levels of physical and emotional distress and may benefit from survivorship care.

Survivorship Issues for Patients With Lung Cancer
Christie L. Pratt Pozo, DHSc, Mary Ann A. Morgan, PhD, and Jhanelle E. Gray, MD

**Background:** Survivorship concerns for patients with lung and bronchus cancers include quality of life and physical and psychological aspects. Recommendations for follow-up care should incorporate a survivorship paradigm and practices for these patients.

**Methods:** The authors conducted a literature review on lung cancer survivorship and the late- and long-term effects of treatment, which can impair quality of life in this patient population.

**Results:** Lung cancer is a diagnosis associated with heavy disease burden, and patients may benefit from survivorship care. High levels of physical and psychological distress leading to diminished quality of life are common in those with lung cancer. Recognition of the potential late- and long-term effects of treatment may help health care professionals intervene early to minimize negative implications.

**Conclusions:** Survivorship care for patients with cancer requires a multidisciplinary effort and team approach. Addressing the survivorship needs of these patients and their caregivers, along with providing a continuum of cancer care, should improve their quality of life. Further research on evidence-based practices on the long-term effects of lung cancer survivorship care is necessary.

**Introduction**
In the United States, 50% of men and 33% of women will develop cancer sometime in their lives. Approximately 13.7 million Americans with a history of cancer were alive on January 1, 2012. The number of people diagnosed with cancer is likely to increase as the “boomer” population ages and cancer survival rates improve. Therefore, 18 million estimated people will survive cancer by the end of the next decade. The mean age of diagnosis for lung and bronchus cancers is 71 years. In 2013, an estimated 228,190 new patients were diagnosed with lung cancer, and approximately 412,230 men and women alive have been diagnosed with lung cancer. For those alive with cancer, these numbers represent 3% of all cancers for both men and women compared with women alive with breast cancer (23%) or men alive with prostate cancer (20%). Most patients with lung cancer are diagnosed at later stages because early disease is often asymptomatic, with only 15% diagnosed at a local stage. Thus, there are fewer long-term survivors of lung cancer. Although both risks and benefits exist for cancer screening tests, low-dose computed tomog-
raphy (CT) scanning may provide earlier diagnoses for patients at high risk, specifically for current and former smokers, and reduce lung cancer mortality rates for those patients at high risk and between the ages of 55 and 74 years.2,5,7-10

For treatment purposes, lung cancer is classified as either non–small-cell lung cancer (NSCLC; 85%) or small-cell lung cancer (SCLC; 14%).1 Limited-stage SCLC is routinely treated with combined chemotherapy and radiation therapy and, on occasion, with surgical interventions. The standard treatment for extensive-stage SCLC chemotherapy with radiation therapy is usually reserved for palliation. For patients diagnosed with early-stage NSCLC, 71% undergo surgery; however, radiation therapy has been curative in rare cases.2,11 Approximately 18% of these patients may also receive chemotherapy or radiation therapy. Patients with advanced-stage NSCLC may be treated with chemotherapy (20%), radiation (17%), or a combination of both (35%). Patients with advanced-stage NSCLC may also be treated with targeted therapy such as erlotinib.2 Treatments for all stages of lung cancer may be difficult to tolerate because they have significant toxicity.12 The 5-year survival rates are 6.1% for SCLC and 17.1% for NSCLC.2,4 By comparison, the 5-year survival rate for all adult cancers is 66%.4,13

Although lung cancer represents a small subset of the survivorship population, it is associated with heavy disease burden that may derive benefit from survivorship care. The purpose of this article is to review survivorship concerns, including quality of life (QOL) and physical and psychological aspects for patients with lung and bronchus cancers. Recommendations for follow-up care that incorporate a survivorship paradigm and practices for these patients are provided. Results from a literature search for lung cancer survivorship and QOL issues, including searches of the Cumulative Index to Nursing and Allied Health, PubMed, Medline, published articles, and Web sites, are also included. Care planning and models for delivering survivorship care are also reviewed.

Overview of Cancer Survivorship

The term cancer survivor has many definitions, but the most accepted definition includes from day of diagnosis to end of life and may involve family members and caregivers.14-17 This differs from the traditional 5 years to be considered a survivor, which is now considered to be an “archaic” definition.17 Thus, with the lower extended survival rates for lung cancer, this definition is more inclusive and appropriate for survivors of lung cancer as well as their loved ones. Paying attention to their physical and psychological status, dealing with uncertainty and QOL issues, and providing and anticipating supportive care may be crucial for those living with and beyond a cancer diag-

nosis.14 It may move a patient from identifying oneself as a victim (helpless, somebody harmed) to a survivor (potential to be someone with powers of endurance or one who manages to grow despite hardship).18

As a pediatrician and survivor of cancer, Mullan19 attempted to identify seasons rather than stages of survivorship as he personally went through the cancer experience. He labeled these as (1) acute season, when the patient undergoes diagnosis and treatment, (2) extended survivorship, when the patient may be cured, in remission, on maintenance therapy, or receiving palliative care, and (3) permanent survivorship (long-term survival or presumed cured).

In 2006, the Institute of Medicine (IOM) published a report16,20 that included 10 recommendations addressing cancer survivorship as a distinct phase of cancer care. The report also defined long-term consequences from treatment or potential late effects from treatment that are unique to cancer survivors, including effects that develop as a result of treatment and that may linger as time goes on. Late effects are also those that may not surface until years after active treatment has been completed. These long-term and late effects of cancer and its treatment may interfere with the ability to function and perform daily activities, and they may include neuropathies, fatigue, pain, cardiovascular issues, lymphedema, depression, sexual dysfunction, cognitive and functional decline, organ failure and damage, secondary malignancies, and cancer recurrence.21,22

In 2010, Miller et al23 updated the seasons of survival paradigm. After the acute season, they incorporated the idea of transition: patients who try to adjust to a new “normal” or those in a transitional phase. They then distinguished extended survivorship as having 3 trajectories: remission, cancer free, or living with cancer. Within this framework, symptoms may appear, disappear, and reappear over time. In addition, they addressed long-term or late effects of cancer and its treatment, as well as second cancers or secondary cancers from treatment consistent with the 2006 IOM reports.16,20

Lung Cancer Survivorship

One of the recommendations from the IOM report was that patients should be provided a survivorship treatment summary and care plan. Ideally, this would be given to patients as they complete the acute phase or season and move on to extended survivorship.16 This differs from general expectations of communications between generalists and specialists, such as cardiologists providing cardiac testing reports, for the following reasons. The treatment of patients with cancer, including those with lung cancer, is complex, often requiring multiple treatment modalities and specialists such as surgeons, radiation oncologists, and medical
oncologists. These treatments may also impact organ systems with immediate complications or have the potential for long-term or late effects. Many patients also have comorbid conditions that may arise during or be affected by their cancer care. For example, compared with the general population, patients with lung cancer have a higher risk of developing a second type of cancer, particularly those with a history of smoking who also have risks for head and neck or urinary tract malignancies.\textsuperscript{2,22} Specifically, as a result of tobacco and chemical exposure, survivors of lung cancer are at an increased risk for related diseases such as chronic obstructive pulmonary disease and cardiovascular disease.\textsuperscript{24} Patients with lung cancer have a higher severity and prevalence of comorbidities than patients with other types of cancers have, and how these affect survival is inconsistent among studies. However, negative effects for both physical and mental health QOL issues have been reported.\textsuperscript{5} Patients with NSCLC who were treated with beta blockers for cardiovascular indications had an overall survival (OS) rate of 22\% compared with 13\% for patients not taking them.\textsuperscript{25} In addition, patients treated with radiation therapy for other malignancies, such as breast cancer or Hodgkin disease, may have an increased risk for a second primary lung cancer. While these secondary malignancies may still occur, they have decreased in incidence with advances in contemporary equipment and radiation treatment dose planning.\textsuperscript{26} For patients, a summary of their treatment can provide a plan for their survival and can facilitate coordination with their primary health care professionals,\textsuperscript{27} identifying symptoms to report as well as potential long-term or late effects caused by their treatments.

The American Society of Clinical Oncology (ASCO) has developed templates for what should be included in SCLC and NSCLC survivorship treatment summaries and care plans.\textsuperscript{28} SCLC and NSCLC cancer survivorship care is also addressed by the National Comprehensive Cancer Network in its 2013 guidelines,\textsuperscript{29} including aspects of surveillance and supportive care important to survivors of lung cancer.

In ASCO’s Quality Oncology Provider Initiative, the report also included whether patients were given a treatment summary.\textsuperscript{30} It is important for health care professionals to note that providing patients who have lung cancer with a survivorship treatment summary and care plan is a standard of care. This was confirmed by the Commission on Cancer,\textsuperscript{31} which also incorporated a new standard that psychological distress be assessed at pivotal visits. The National Cancer Institute Community Cancer Programs (NCCCP) are also required to provide lung cancer survivorship programs and care plans.\textsuperscript{32}

Barriers do exist regarding the development of treatment summaries and care plans, including time, resources, and issues of electronic health record integration.\textsuperscript{33} The health care field will need to develop strategies for the effective incorporation of survivorship plans into the medical records. One model that has been developed is Journey Forward, which is a downloadable program for health care professionals and their patients that provides a survivorship care plan builder when cancer treatments are put into the system.\textsuperscript{32} It does not directly interface with the electronic medical record, but it has been used by nurses in community health settings. The templates for ASCO’s survivorship care plans and Journey Forward can be accessed at the Web sites listed in Table 1.

### Models and Survivorship Programs

In academic cancer centers, various models of survivorship care are being developed and evaluated for their survivorship care effectiveness. These include disease-specific models (eg, breast, colon), one-time consultative models that review all of the patient re-

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<thead>
<tr>
<th>Resource</th>
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<th>Web Site</th>
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<tr>
<td><strong>American Society of Clinical Oncology</strong></td>
<td><strong>Integrating Tobacco Cessation:</strong> Practice guides for providers, patient education, tools and resources for cessation planning, coverage for patient services and additional resources</td>
<td><a href="http://www.asco.org/practice-research/tobacco-cessation-and-control-resources">www.asco.org/practice-research/tobacco-cessation-and-control-resources</a></td>
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<td><strong>Lung Cancer Templates:</strong></td>
<td>• Small-cell lung cancer treatment plan and summary resources</td>
<td><a href="http://www.asco.org/institute-quality/small-cell-lung-cancer-treatment-plan-and-summary-resources">www.asco.org/institute-quality/small-cell-lung-cancer-treatment-plan-and-summary-resources</a></td>
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<tr>
<td></td>
<td>• Non-small-cell lung cancer treatment plan and summary resources</td>
<td><a href="http://www.asco.org/institute-quality/non-small-cell-lung-cancer-treatment-plan-and-summary-resources">www.asco.org/institute-quality/non-small-cell-lung-cancer-treatment-plan-and-summary-resources</a></td>
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<tr>
<td><strong>National Coalition for Cancer Survivorship: Journey Forward</strong></td>
<td>Customized survivorship care plan builder</td>
<td><a href="http://www.canceradvocacy.org/partnerships/journey-forward.html">www.canceradvocacy.org/partnerships/journey-forward.html</a></td>
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treatment summary and care plan, long-term general survivorship care models that follow many cancer types, and integrated models where patients are followed by advanced practice professionals at the end of treatment or are on maintenance therapy.\textsuperscript{33} 

In the community, many oncology practices have developed survivorship clinics or expanded their services. In 22 states, the National Cancer Institute has provided funding to 30 community cancer centers through the NCCCP to enhance services at local community hospitals with shared resources, presentations, and the NCCCP Web site.\textsuperscript{32,33} Regardless of the type of survivorship model implemented, primary care must be integrated for the coordination of patient care. Some patients with low intensity and low risk for recurrence are referred back to their primary providers for ongoing follow-up. Other patients share care between oncologists and primary care providers.\textsuperscript{34} The Survivorship Care Plan was recommended by the IOM to assist in this coordination of care. Although ASCO endorses the National Coalition for Cancer Survivorship definition of a survivor as any patient with a diagnosis of cancer, by focusing on high-quality cancer survivorship care, ASCO has limited its focus to individuals who have successively completed curative treatment or have transitioned to maintenance or prophylactic therapies.\textsuperscript{23,35} Each site will need to define \textit{survivor} as a key aspect of developing a survivorship program. 

Patients with stage I lung cancer may be transferred back to their primary care physician after 5 years of annual history and physical examinations, laboratory studies, and chest radiography. However, compared with the general population, these patients continue to have a higher risk for second malignancies.\textsuperscript{35} Given the complexity of treatment and frequent late stage at diagnosis, the shared care model is likely most appropriate for survivors of lung cancer. In this model, patient care is shared among specialist and generalist providers whose roles are clearly delineated and ongoing communication is established, with a periodic transfer of knowledge available from the oncology team to the primary care providers and pulmonologists. The care plan should include a summary of treatments given, potential long- and late-term effects, a formal follow-up plan of testing and visits, and healthy lifestyle recommendations such as smoking cessation, diet, and exercise. Different models exist to determine who will prepare such a document (eg, the oncology team prepares this plan in the disease-specific model, while the long-term survivorship clinics may complete the plan in the consultative model). Although the individual who completes these will likely be determined from site to site, it is clear that physicians, advanced practice professionals, and nurses are likely to be involved.\textsuperscript{32,33} Since reimbursement for preparing these documents is not yet available, when reviewing them with patients, counseling time should be documented for appropriate coding.

### Quality of Life

QOL is defined as a multidimensional construct that encompasses social, physical, cognitive, and psychological domains.\textsuperscript{12,36,37} Health-related QOL domains include pain, fatigue, depression, physical functioning, and distress. Several generic and disease-specific instruments have been developed and widely used in research to assess QOL domains.\textsuperscript{5,36,38-47} The concept of QOL has become an important end point for treatment and clinical trial evaluation, and it has been used as an independent prognostic predictor for survivors of lung cancer.\textsuperscript{15,36} The main factors that play a role in QOL for survivors of lung cancer are discussed below.

#### Surgery, Radiation, and Chemotherapy

For patients with lung cancer, QOL has been examined as a construct in terms of treatment modalities. Surgical resection among patients with early-stage lung cancer offers the best chance for long-term survival.\textsuperscript{48} Although resection offers the best survival outcomes, research indicates that this modality can have implications on QOL. Studies examining the short- and long-term impact of surgical resection found that postthoracotomy pain, functional limitations due to reduced lung capacity, fatigue, persistent cough, and dyspnea can persist and can negatively impact QOL.\textsuperscript{40,42} Pain, fatigue, and dyspnea are common after pulmonary resection and can persist in the long-term for patients.\textsuperscript{7,39} Kenny et al\textsuperscript{39} found that approximately one-half of patients still experience increased dyspnea, fatigue, and role functioning relative to their preoperative levels. Ostroff et al\textsuperscript{48} examined the health-related QOL of survivors of early-stage lung cancer 1 to 6 years postresection and concluded that posttreatment follow-up to identify depression and dyspnea was warranted. Similar results were found in studies by Ozturk et al\textsuperscript{41} and Lagerwaard et al\textsuperscript{42} among survivors of lung cancer who had undergone radiation. In addition, changes in pulmonary functioning and the occurrence of clinical pneumonitis are documented adverse events of radiation therapy. Many patients with lung cancer undergo chemotherapy both in the adjuvant setting and as a single modality. Chemotherapy agents have known toxicities and cause physical aberrations, cardiopulmonary toxicities, and neuropathy.\textsuperscript{5} Although some of these symptoms subside after treatment, many have long-term or late effects that can impact well-being. For patients with lung cancer who remain on maintenance therapeutics and anticancer biologics, these effects may be persistent and may impede relief.
Symptom management guidelines for patients with lung cancer\(^{10}\) have been developed that address pain, dyspnea, cough, depression, fatigue, and many other symptoms or complications that may occur as a result of treatment, as well as disease progression.

Although most cancer survivors benefit from QOL comparable with that of the general population, approximately 20% of survivors experience compromised QOL due to the residual effects of their cancer diagnosis and treatment.\(^{21}\) This proportion may be even greater among survivors of lung cancer who frequently undergo toxic multimodality and multiple lines of aggressive treatment. Survivors of lung cancer do not experience the same life expectancy and QOL relative to other cancer diagnoses.\(^{5,49}\) This population often experiences other comorbidities that can profoundly impact the physical, psychosocial, and emotional aspects of well-being.\(^{24,36}\) These adverse psychological and physical symptoms faced by cancer survivors may also have the potential for increased mortality rates.\(^{14}\)

**Patient Age**

Age is another compounding factor that can impact QOL. Approximately 68% of lung cancer diagnoses are among those aged 65 years and older.\(^{21,50}\) The late effects and long-term issues among patients are often compounded by the effects of normal aging and increased comorbidities.\(^{21}\) Bellury et al\(^{22}\) proposed the use of a conceptual model that takes into account the normal aging process and how aging further impacts the related problems of cancer survivors. Due to the nature of lung cancer, a need exists for increased interventions with this subgroup at elevated risk for poor QOL.\(^{5,49}\)

**Physical Impact**

The physical implications of a diagnosis and subsequent late- and long-term adverse events of treatment have been documented in the literature to negatively impact QOL.\(^{5,36,38}\) The physical domains of QOL have received attention in postoperative patients: impaired pulmonary function (forced expiratory volume in 1 second < 70% predicted), diminished exercise capacity, and restrictions in physical activity. These changes in physical functioning may persist into survivorship.\(^{5,36}\) Survivors of lung cancer undergo a heavy burden of illness\(^{5}\) and often experience physical symptoms such as pain, fatigue, dyspnea, and cough.\(^{51}\)

**Cancer-Related Pain**

Cancer-related pain is a frequent and distressing symptoms reported among those with lung cancer. It is also the most common cause of disability and is associated with depression, anxiety, and sleep disturbances.\(^{46}\) Uncontrolled cancer-related pain has major implications on QOL; therefore, interventions for pain control should be incorporated into posttreatment care plans.\(^{46,52}\) Despite the known high frequency and clinical relevance, up to 45% of patients have inadequate pain control and 40% of 5-year survivors report cancer pain.\(^{49}\) The results of a cohort study have indicated that a genetic predisposition to pain severity may be present that aids in the identification of survivors of lung cancer who have the highest risk for morbidity and poor QOL.\(^{49}\) Chronic pain is the most common complication following surgery and was the most commonly reported problem among survivors of lung cancer.\(^{7}\) A mild but chronic pain following lung surgery is known as postthoracotomy pain syndrome and is seen in as much as 80% of patients. Pain lasted for approximately 4 years in 30% of patients.\(^{5}\)

**Fatigue**

Fatigue is the most commonly reported symptom among survivors of lung cancer, affecting up to 90% of survivors.\(^{35}\) The medical literature shows that fatigue in patients with lung cancer is correlated with dyspnea, depressed mood, and anxiety. Contributing factors of fatigue include comorbidities, pain, psychological distress, sleep disturbances, and changes in breathing capacity.\(^{5,53}\) Therefore, a comprehensive approach to the treatment of fatigue, particularly for patients with lung cancer, should include screening and management of anxious and depressive symptoms as well as pulmonary disorders.\(^{35}\)

Fatigue is described as a persistent lack of energy that can impair daily functioning and mood. It is debilitating sequela affects all aspects of life. Persistent fatigue can negatively affect QOL by disrupting the ability to perform activities of daily living. Fatigue can linger and impair functioning for 1 to 7 years after treatment completion.\(^{14}\) Guidelines for screening for fatigue with appropriate assessments are included in the National Comprehensive Cancer Network cancer-related fatigue algorithm for all patients with cancer, including cancer of the lung.\(^{54}\)

**Dyspnea**

Dyspnea is labored, difficult breathing or “shortness of breath” and is often associated with lung cancer. Dyspnea may also be associated with other respiratory conditions such as asthma, chronic obstructive pulmonary disease, or emphysema. Dyspnea was correlated with increasing fatigue, pain, insomnia, and appetite loss. The perceptions of symptoms of a survivor of lung cancer are influential to QOL, implying that monitoring respiratory symptoms is important for those undergoing surgical procedures and/or radiation therapy.\(^{55,56}\) In addition, in the presence of dyspnea, physical, cognitive, and emotional functions were found to be significantly lower.\(^{5}\)
Psychological Impact
The psychological effects and emotional impact of cancer have been well documented.7,58,59 Although surviving a cancer diagnosis may evoke a new appreciation for life and a positive effect for some people,6,52 many experience negative implications of their diagnosis that impact QOL, which may then manifest into psychological symptoms.

Distress
As many as 80% of survivors of cancer experience some degree of psychological distress, anxiety, and depression.36 The overall psychological burden of cancer is referred to as distress. Cancer type was recognized as one of the best predictor of psychological distress. Patients with lung cancer were identified as having distress 3 times more commonly than patients with other cancer types.58 Weisman and Worden55 were among the first to identify risk factors for persistent vulnerability to emotional distress after treatment. These factors remain predictors of poor adjustment and include a history of depression and psychological issues, lack of social support, lack of economic resources, external stressors, treatment-related sequelae, comorbid conditions, and proximity from active treatment.14,60

The emotional and psychological distress common in patients with cancer may cause a decline in both cognitive and social functioning.47,61 Distress can also affect QOL throughout the disease course.36 Between 25% and 40% of cancer survivors continue to experience distress, often severe enough to require intervention. Although there are varied levels of distress, even mild symptoms can impact daily living functioning and QOL. Mild distress includes symptoms of fear, sadness, worry, uncertainty, poor sleep, and lack of concentration. Distress also encompasses a variety of psychological manifestations, including depression and anxiety, and is often thought to be acutely associated with diagnosis.12,59 However, it is important to recognize that levels of distress change over the cancer trajectory and that coping capacity and social support play important roles in influencing emotional distress.8,62 Two important factors positively associated with adaptation to distress include a patient’s perceived social support and a positive coping style.14,60 Depression among those with lung cancer has been identified as a serious, often underreported and undertreated problem.36 Rates of reported depression among survivors of lung cancer vary from 11% to 44%.14 Research utilizing both qualitative and quantitative methodology indicates that depression among survivors of lung cancer is highly correlated with a lower QOL.7,36

Stigma
Stigma has a negative impact on health status. How those affected by the disease perceive themselves, as well as how they are treated by others and the health care system, can have adverse effects.69 Based on its strong association with cigarette smoking, lung cancer is often seen as a preventable diagnosis. As a result, patients are often stigmatized for having caused their disease.63 Stigma has been found to be highest among those with lung cancer when compared with other cancer diagnoses.63

The impact of lung cancer stigma is far-reaching, resulting in a lack of funding allocations for research, translating into stagnant low survival rates and poor prognoses.1,64 Stigma, both perceived and real, has strong implications on a patient’s well-being. Stigma can elevate levels of stress associated with the disease and contribute to social and psychological morbidity, access to care, and social support.65 Perceived stigma can manifest into negative outcomes for patients with lung cancer, and it has been shown to increase depression and depressive symptoms among those with lung cancer.66 Regardless of a positive or negative smoking history, a strong association exists with depression and decreased QOL as a result of perceived stigma. A notable lack of resources exists for those diagnosed with lung cancer compared with other cancers.67 Lung cancer stigma can also affect social support. Stigma can prevent one from seeking social support, with lower social interactions, and affect access and availability to resources.67 A recognition of the profound impact that stigma has on illness burden and distress level is also important when developing interventions and allocating resources throughout the continuum of cancer care for these patients.

Anxiety
Anxiety is a seen as a normal response to a cancer diagnosis, but it can have substantial negative effects on QOL and can manifest into physical and behavioral symptoms. Persistent anxiety can impede daily functioning. Heightened anxiety has been found to be correlated with an increase in physical symptoms and a decrease in functioning.68 Fear of recurrence is prevalent across disease sites, ranging from 5% to 89% of survivors.14 Anxiety, fear of recurrence, and uncertainty may be even more prevalent among sur-
vivors of lung cancer, as recurrence most often occurs within the first 2 years after diagnosis; however, the risk remains elevated for up to 10 years. In addition, those with NSCLC are at risk for a second malignancy, including second lung, larynx, and bladder cancers, even 10 years after the initial diagnosis. Although fear and anxiety tend to decrease over time, the degree of worry about recurrence varies and may be triggered by the onset of an unexplained symptom or anxiety related to follow-up.

**Survival, Psychosocial Needs, and Health Promotion**

**Surveillance**

Care plans that address the need for follow-up surveillance should include imaging, blood tests, and clinic visits, all of which should occur annually for patients with lung cancer who are further than 5 years from the time of diagnosis. Patients should be instructed to call their provider if symptoms occur (Table 2), and they should also be provided with recommendations for healthy behaviors that address smoking cessation, if appropriate, as well as physical activity and interventions specific for them. Patients with lung cancer may need oxygen or pulmonary rehabilitation to improve or to optimize their functioning. Their psychological distress/depression should be assessed with appropriate referrals made and assistance with social services if caregiver/financial services are needed. Interventions that recognize the value of physical activity, nutrition, and the adoption of healthy behaviors may also be important in

<table>
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<tr>
<th>Table 2. — Survivorship Treatment Summary/Care Plan Elements</th>
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<tr>
<td><strong>Patient Name:</strong></td>
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<tr>
<td><strong>Date of Birth:</strong></td>
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<td><strong>Age:</strong></td>
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<tr>
<td><strong>Medical Oncology Provider:</strong></td>
</tr>
<tr>
<td><strong>Surgical Oncology Provider:</strong></td>
</tr>
<tr>
<td><strong>Radiation Oncology Provider:</strong></td>
</tr>
<tr>
<td><strong>Background Information:</strong></td>
</tr>
<tr>
<td>Diagnosis, relevant tests, very brief summary of what led to treatment</td>
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<td><strong>Cancer Surgery History:</strong></td>
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<td>Dates, procedure, pathology, cancer staging</td>
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<td>Neoadjuvant or adjuvant, multiple-gated acquisition ejection fraction if anthracyclines prior to therapy</td>
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<td><strong>Drugs, Dosages, No. of Cycles, Dates:</strong></td>
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<td><strong>Adverse Events:</strong></td>
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<td><strong>Targeted Therapies:</strong></td>
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<td><strong>Follow-up Care:</strong></td>
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<td>Surveillance (including frequency, imaging, tests, blood work)</td>
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<td><strong>Sign and Symptoms to Report:</strong></td>
</tr>
<tr>
<td>New or worsening pain, loss of appetite with unintentional weight loss, worsening shortness of breath or cough, coughing up blood, headache, weakness</td>
</tr>
<tr>
<td><strong>Recommendations:</strong></td>
</tr>
<tr>
<td>Pulmonary rehabilitation, smoking cessation, alcohol consumption, psychiatrist, psychologist, dietitian, social worker, or physical therapy referrals, support groups, weight management, exercise and diet, dental and bone health, sun screening and protection, immunizations (pneumococcal vaccine and influenza), cancer screenings, comorbidities to be managed by primary care provider (eg, hypertension)</td>
</tr>
<tr>
<td><strong>Resources:</strong></td>
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<tr>
<td>Listing of cancer survivorship resources</td>
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Adapted from references 16, 28, and 29. Elements from American Society of Clinical Oncologist’s Survivorship Treatment Summary are reused with permission, © 2012 American Society of Clinical Oncology. All rights reserved.
survivorship care planning. A list of such resources is shown in Table 3.

Psychosocial Needs
The Commission on Cancer psychosocial distress screening standard requires that distress be addressed at pivotal visits, such as acute diagnosis or transitions when distress may be highest so that appropriate supportive care, referrals, or both can be made. Utilization of a distress thermometer serves as a quick screening instrument that can be completed by the patient at these pivotal visits. Research indicates that when QOL assessments and psychosocial concerns are addressed on an ongoing basis, outcomes can be positively affected.

Health Promotion
Smoking Cessation: Smoking is the primary risk factor for the development of lung cancer. A growing body of evidence suggests that continued smoking by patients after a lung cancer diagnosis is linked with less effective treatments and a greater risk of dying. With improved cancer treatments and earlier detection, smoking cessation is increasingly important and is an integral part of lung cancer survivorship care. Quitting smoking has significant positive effects: decreased risk of cancer and comorbidities, increased survival time, decreased postoperative complications, increased efficacy of chemotherapy, decreased complications from radiation therapy, and overall improved QOL with improved psychological well-being and

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<thead>
<tr>
<th>Organization</th>
<th>Description</th>
<th>Web Site</th>
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<tbody>
<tr>
<td>American Cancer Society</td>
<td>Access to smoking cessation tools, resources, and support for those who have made the decision to quit smoking</td>
<td><a href="http://www.smokefree.gov/www.cancer.org/Healthy/StayAwayfromTobacco/index">www.smokefree.gov/www.cancer.org/Healthy/StayAwayfromTobacco/index</a></td>
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<td>Tools for developing healthy habits after treatment and an online community for cancer survivors, family, and friends</td>
<td><a href="http://www.cancer.org/www.csncancer.org">www.cancer.org/www.csncancer.org</a></td>
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<tr>
<td>American Society of Clinical Oncology</td>
<td>Downloadable survivorship tools and care plans</td>
<td><a href="http://www.cancer.net/survivorship">www.cancer.net/survivorship</a></td>
</tr>
<tr>
<td>CancerCare</td>
<td>Access to Post Treatment Survivorship, which offers information on counseling, education, financial assistance, and practical tools for survivors</td>
<td><a href="http://www.cancer.org">www.cancer.org</a></td>
</tr>
<tr>
<td>Centers for Disease Control and Prevention</td>
<td>Access to tools from the National Action Plan for Cancer Survivorship and Survivor Cancer and Life</td>
<td><a href="http://www.cdc.gov/cancer/survivorship/">www.cdc.gov/cancer/survivorship/</a></td>
</tr>
<tr>
<td>Institute of Medicine</td>
<td>Access to recommendations and printable tools from the Cancer Survivorship: Improving Care and Quality of Life and From Cancer Patient to Cancer Survivor: Lost in Translation reports</td>
<td><a href="http://www.iom.edu/CMS/28312/4931/30869">www.iom.edu/CMS/28312/4931/30869</a></td>
</tr>
<tr>
<td>LIVESTRONG Foundation</td>
<td>Resources on the physical, emotional, and practical effects of cancer and downloadable care plans</td>
<td><a href="http://www.livestrong.org">www.livestrong.org</a></td>
</tr>
<tr>
<td>Lung Cancer Alliance</td>
<td>Free tools and support for those living with lung cancer</td>
<td><a href="http://www.lungcanceralliance.org">www.lungcanceralliance.org</a></td>
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<tr>
<td>National Cancer Institute</td>
<td>Office of Cancer Survivorship offers tools and resources for survivors and their families such as Coping with Cancer: Survivorship-Living With and Beyond Cancer and Facing Forward: Life After Cancer Treatment</td>
<td><a href="http://www.cancer.gov/www.cancer.gov/cancertopics/coping/survivorship">www.cancer.gov/www.cancer.gov/cancertopics/coping/survivorship</a></td>
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<tr>
<td>National Coalition for Cancer Survivorship</td>
<td>Survivor-led advocacy organization with free resources such as Cancer Survival Toolbox and A Cancer Survivor’s Almanac</td>
<td><a href="http://www.canceradvocacy.org">www.canceradvocacy.org</a></td>
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<tr>
<td>National Comprehensive Cancer Network</td>
<td>Downloadable disease-specific patient guidelines and resources</td>
<td><a href="http://www.nccn.com">www.nccn.com</a></td>
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<tr>
<td>National Lung Cancer Partnership</td>
<td>Education, support, and resources for patients</td>
<td><a href="http://www.nationallungcancerpartnership.org">www.nationallungcancerpartnership.org</a></td>
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<tr>
<td>OncoLink</td>
<td>Access to the OncoLink Survivorship Care Plan, offering individualized care plans based on the Institute of Medicine recommendations for cancer survivors</td>
<td><a href="http://www.oncolink.org">www.oncolink.org</a></td>
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self-esteem. Patients with lung cancer who have successfully accomplished smoking cessation report decreased fatigue and shortness of breath, as well as an increased physical activity level and improved appetite, sleep, and mood. Clinicians may be reluctant to counsel patients due to the belief that it may be too late, and they may have concerns about patient feelings of stigma, self-blame, and coping skills. Smoking cessation should be addressed at every visit, with support offered to enable patients to quit. Among patients with lung cancer who were current smokers at the time of diagnosis, 44% were able to quit smoking; of those who continued to smoke, only 62% had smoking cessation addressed in their clinic visit. An excellent resource for health care professionals that provides pharmacotherapy information for smoking cessation treatment is Rx for Change, which is sponsored and maintained by the University of California, San Francisco School of Pharmacy. Guidelines are available to help clinicians counsel patients, including the five As — Ask, Assess, Advise, Assist, and Arrange — with specific adaptations for patients with lung cancer also available. ASCO has a tobacco cessation and control Web site with resources for providers and patient education material, including coverage for patient services with insurance (Table 1). Family members should also be assessed because smoke-free homes and social support can affect relapse. Survivorship care should offer full support and tobacco dependence treatment tailored to the specific needs of patients.

**Physical Activity:** Healthy behaviors and lifestyle factors play an influential role across the continuum of care. The benefit of physical activity is widely accepted as an important factor in primary prevention and impact; however, research indicates that moderate levels of physical activity, both during and posttreatment, are important. Strong evidence suggests that a structured physical activity program woven into treatment and survivorship can improve symptom management and QOL. Physical activity, coupled with a stress management program, is an effective intervention that may yield improvements in the QOL of patients with lung cancer undergoing treatment. Physical activity is an effective intervention recommended for survivors beyond active treatment. Research indicates that a significant association exists between levels of physical activity, QOL, and symptom management among long-term lung cancer survivors. Lung cancer survivors who engage in regular physical activity have reported a better QOL across all domains and fewer distressing symptoms, as reported in reduced pain severity, decreased shortness of breath, less fatigue, and decreased frequency of both dry- and phlegm-producing cough when compared with sedentary long-term survivors.

Although a lung cancer diagnosis and its related treatment may adversely affect functional ability, survivors may still benefit from some modified level of physical activity. Physical activity may benefit all subgroups of patients with lung cancer. Those with limited functional ability and poorer pulmonary function may benefit from interventions that encompass lower-intensity physical activity. Patients who have anemia, compromised immune function, severe fatigue, indwelling catheters, neuropathies, and multiple and uncontrolled comorbidities will need specific precautions and directions. Systematic reviews recommend that some level of physical activity may improve QOL even in patients with advanced cancer, but the activity level should be individualized to each patient’s physical abilities. Based on the evidence that physical activity has multiple benefits for survivors of cancer, health care professionals and patients should work together to explore the integration of exercise into the posttreatment care of lung cancer.

**Nutrition:** In general, cancer survivors should try to consume plant-based foods with at least 5 servings a day of a variety of colorful vegetables and fruits. In addition, survivors should choose foods that contain whole grains (eg, breads, brown rice, whole wheat pastas). Other guidelines recommend limiting processed and red meat and encourage diets with poultry and fish, while avoiding high-fat foods or preparations using high-fat products/methods. Supplements are generally not recommended because important minerals and nutrients can usually be derived from eating a healthy, balanced diet.

**Conclusions**
Most of the focus for patients with lung cancer has been on survival rates. Patients with lung cancer should be included in the survivorship paradigm as progress is made; it is worth noting that 17% and 6% of patients with non–small-cell and small-cell lung cancer, respectively, have survival rates longer than 5 years. Those with lung cancer, in concert with their health care team, should be guided to optimize their quality of life, addressing their needs from physical, psychological, and social perspectives wherever they are in the cancer diagnosis continuum.

As a result of the high mortality of the disease, long-term survivors of lung cancer have been underrepresented in survivorship research. However, cancer survivorship cohort studies have suggested that survivors may experience a heavy burden of disease and have a high frequency of symptoms that persist after active treatment ends. A subset of these patients is also at high risk for tumor recurrence, secondary malignancies, and comorbidities.

Survivorship care plans for patients with lung cancer should be streamlined for factors specifically
associated with the disease. In addition to long-term survival rates, comorbidities may affect outcomes. For example, lung cancer can frequently co-occur with cardiovascular disease. In a retrospective study of a large cohort of patients with non–small-cell lung cancer during definitive radiation therapy, beta-blocker use was associated with improved distant metastasis-free survival, disease-free survival, and overall survival rates, but not locoregional progression-free survival rates. Based on preclinical trials, no association with beta-blocker use and locoregional progression-free survival rate was present. Wang et al suggested that these drugs may affect the tumor metastatic cascade rather than the primary tumor, proposing that further exploration of selective and nonselective beta blockers is needed to validate these retrospective findings while also looking at the length and timing of beta-blocker use.

High levels of physical and psychological distress are common in those with lung cancer, thus leading to diminished quality of life. These factors, as they pertain to patients with lung cancer, further solidify the need for future research in order to drive the optimization of lung cancer survivorship care templates. Lung cancer carries a risk of secondary malignancy that continues to remain high for up to 10 years. Specific guidance on surveillance with testing and imaging tools to capture outcomes when these tools are available is of great importance that the medical community expands its understanding of care until end of life.58

References