Palliative Care in Lung Cancer

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KEYWORDS

• Palliative care • Quality of life • Symptom management

An estimated 222,000 new cases of lung cancer were diagnosed in the United States in 2010, and approximately 157,000 patients died from the disease.[1] Despite complete resection and curative intent, many patients with early stage, resectable lung cancer experience recurrence. After potentially curative surgical resection, the 5-year survival rate for early stage non–small cell lung carcinoma (NSCLC) is commonly accepted to be 60% to 80% for stage I, 40% to 50% for stage II, and 10% to 20% for stage IIIA.[2,3] Two thirds of these patients recur systemically, and the remaining one third recur locally.[4] Because recurrent disease is common, aggressive symptom management and support using an interdisciplinary palliative care model becomes an important aspect of care. This article describes the role of palliative care for patients with lung cancer.

DEFINING PALLIATIVE CARE

Palliative care is a concept in medical care that has expanded within the last decade to address the supportive care needs that accompany the occurrence of life-threatening disease. The concept addresses different aspects in the trajectory of cancer. In its recent 2009 update, the National Consensus Project Clinical Practice Guidelines for Quality Palliative Care defines palliative care as "medical care provided by an interdisciplinary team, including the professions of medicine, nursing, social work, chaplaincy, counseling, nursing assistant, and other health care professions focused on the relief of suffering and support for the best possible quality of life (QOL) for patients facing

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serious life-threatening illness and their families. It aims to identify and address the physical, psychological, spiritual, and practical burdens of illness". **Fig. 1** illustrates how palliative care fits with the treatment of lung cancer.[5] Palliative care begins at the time of diagnosis of a serious disease; continues throughout treatment, cure, or until death; and involves the family during the bereavement period.

Studies have been conducted during the past few decades to determine the effect of early introduction of palliative care in cancer. Recently, Temel and colleagues[6] published findings from a randomized clinical trial to examine the effect of introducing palliative care at diagnosis on QOL changes at 12 weeks for patients with metastatic NSCLC. Patients enrolled in the study received either early palliative care integrated with standard oncologic care or standard oncologic care alone (N = 151). Results were in favor of the early palliative care group, where better QOL was observed compared with patients who received only standard oncologic care. Fewer depressive symptoms were observed for the palliative care group. Most interestingly, patients in the palliative care group received less aggressive care at the end of life, but their median survival was longer (11.6 months vs 8.9 months; $P = .02$).[6]

QOL and Symptoms in Early Stage NSCLC

Several studies have described QOL in early stage NSCLC postoperatively. Balduyck and colleagues[7] followed 100 patients with NSCLC for 12 months postoperatively and found that the QOL evolution in patients who received a lobectomy or wedge resection was comparable with a 1-month transient decrease in functioning and increase in pain. Other studies have found similar transient QOL decreases postoperatively, with general recovery seen between 3 and 9 months postoperatively.[8,9] Patients who underwent a pneumonectomy had the worst outcome, with poor physical functioning, poor role functioning, pain, dyspnea, emotional problems, and decreased pulmonary functions that did not recover to baseline.[10] Pneumonectomy was also found to be predictive for hospital readmissions and mortality postoperatively.[11]

In a longitudinal study exploring QOL in patients with resected NSCLC 2 years postoperatively, surgery substantially reduced QOL across all dimensions except emotional functioning.[4] Approximately half of patients continued to experience symptoms and diminished functioning after 2 years.[12] In a study with long-term survivors of lung cancer (>5 years), Sarna and colleagues[13] found that 22% of survivors had distressed mood, and 50% experienced moderate to severe pulmonary distress.

Studies have also identified determinants of QOL after pulmonary resections. Preoperative QOL has been found to predict postoperative QOL, with continued declines in physical, social, and psychological states and slower recovery.[12,13] Factors that provoke the most fear in patients with resectable NSCLC are not surgical risks of perioperative morbidity or mortality, but the physical and mental handicaps that hinder recovery postoperatively.[14,15] Common disease and treatment-related symptoms include dyspnea, cough, fatigue, pain, lack of appetite, and insomnia.[16]

Fig. 1. How palliative care fits with the treatment of lung cancer. Palliative care begins at the time of diagnosis of a serious disease; continues throughout treatment, cure, or until death; and involves the family during the bereavement period.

The average number of symptoms per patient in NSCLC has been reported to be around 14 with 2.3 symptoms rated as severe.[17]

In a systematic review of symptoms in lung cancer, Cooley[16] concluded that patients with lung cancer experienced multiple symptoms that differed across illness trajectories and treatments. In early stage NSCLC where surgical interventions are the primary treatment, postoperative symptoms include pain and dyspnea.[3] Postthoracotomy pain syndrome is defined as an aching or burning sensation that persists or recurs along the thoracotomy scar at least 2 months postoperatively, and neuropathic symptoms, such as paresthesia–dysesthesia and hypoesthesia, are reported in 69% and 40% of patients, respectively.[18,19] Immediately after a thoracotomy, 90% of patients report varying degrees of pain.[20] The incidence of chronic postthoracotomy pain is estimated to be 26% to 67%.[20] Predictors of chronic postthoracotomy pain include severe acute postoperative pain, high consumption of analgesics postoperatively, female gender, the extent of surgery, and psychological distress.[21,22]

Respiratory symptoms, such as cough, dyspnea, wheeze, and hemoptysis, are common in NSCLC, occurring in 40% to 85% of patients.[23] These symptoms may be present at diagnosis or as a direct result of treatment, and prevalence is dependent on tumor type, disease stage, gender, age, and living situations.[24,25] Dales and colleagues[26] followed patients with NSCLC after thoracic surgery and found that dyspnea and QOL deteriorated up to 3 months postoperatively, but returned to baseline at 9 months. In a study exploring dyspnea and QOL in patients with both early and late stage NSCLC (N = 120), Smith and colleagues[25] found that advanced disease was not correlated with dyspnea. This finding suggests that patients with early stage NSCLC who are most likely to be cured may also be faced with debilitating breathlessness that results in poor QOL during survivorship.[27,28] In one large prospective cohort study of 939 patients with stage III or IV NSCLC hospitalized at five teaching hospitals in the United States, severe dyspnea was recorded in 32% of patients, and in 90% of patients near death.[29]

The psychological implications of lung cancer have been documented extensively in the literature. A number of studies have documented the presence of depression among patients with lung cancer, with an incidence rate of 15% to 44% in patients with newly diagnosed NSCLC.[30] Studies have shown that the 1-, 2-, and 3-month prevalence of depression in patients with NSCLC after curative resection was 9%, 9.4%, and 5.8%, respectively.[31] The prevalence of psychological distress is the highest among patients with lung cancer compared with solid tumors.[19] Factors that are associated with psychological distress include such symptoms as pain, poor performance, age, social support, physician support, and marital status.[19] Faller and Bulzebruck[32] studied coping and survival in 103 patients with lung cancer using a 10-year follow-up. Coping was assessed before treatment by using both self-reports and interviewer ratings. Findings suggest that self-reported depressive coping style was linked with shorter survival, and active coping style was linked with longer survival. Maliski and colleagues[33] interviewed 29 lung cancer survivors (>10 years) and identified five key themes: (1) existential issues, (2) health and self-care, (3) physical ability, (4) adjustment, and (5) support.

Research has shown that social support is associated with distress among patients with cancer and is positively related to QOL.[34,35] Walker and colleagues[36] found that the type of social support available to patients with NSCLC predicted more adaptive coping in early stage disease (N = 119). A more assisting and cooperative support that leaves responsibilities and choices to the patient was associated with adaptive coping, whereas support that entails others taking responsibility for tasks and telling the patient what to do was associated with less adaptive coping.[36] Worries about the illness, family, and the future relating to the illness are the most common

psychosocial concerns.[37] Hill and colleagues[37] reported that less than half of the concerns of patients with NSCLC (43%) were discussed by providers. Patients' psychosocial symptoms were more worrisome than physical symptoms, and psychosocial concerns were least likely to have been dealt with effectively.[37]

Diagnosis of a life-threatening disease, such as NSCLC, can cause enormous spiritual distress. Finding meaning in illness has shown to positively affect QOL. A cross-sectional study conducted by Downe-Wamboldt and colleagues[38] documented that overall QOL in patients with NSCLC is predicted most by meaning of illness, specifically the illness being perceived as manageable. In a study conducted among 60 patients with NSCLC, Meraviglia[39] found that people who reported more meaning in life had better psychological well-being. Furthermore, as the level of meaning in life increased, symptom distress decreased among the study participants. Finally, Sarna and colleagues[40] examined the relationship between meaning of illness and QOL in women with NSCLC (N = 217). Findings suggest that depressed mood, negative conceptualizations of meaning of illness, and younger age explained 37% of the variance of global QOL and were correlated with poorer QOL. In this study, more than a third of patients associated lung cancer with negative meaning.[40]

Palliative Symptom Management in Lung Cancer

Given the multitude of symptoms patients can experience, alleviating discomfort often requires several treatment modalities to reach an acceptable goal of palliation. With respect to decrements in QOL related specifically to the tumor itself, the general assault on health by lung cancer can be broadly separated into four categories of clinical problems: (1) those caused by the primary tumor, (2) those caused by metastases, (3) those caused by treatment, and (4) those caused by paraneoplastic syndromes.[41] In addition to problems attributable to the diagnosis of lung cancer, patients also often carry the burden of significant comorbid disease. Because the average age of presentation of lung cancer is 71,[42] a sizable percentage of patients with lung cancer have preexisting disease, both related and unrelated to tobacco products. Such tobacco-related diseases include cerebrovascular disease, coronary vascular disease, peripheral vascular disease, heart failure, aortic aneurysm, and chronic obstructive pulmonary disease (COPD). Despite the presence of these multiple comorbid diseases, most patients with lung cancer die of the lung cancer rather than the comorbid diseases, even when lung cancer presents in early stage.

Symptom management begins with a conversation between provider and patient, taking time to assess the patient's symptoms and educate the patient and family about possible treatment options. Clinicians should evaluate for potentially correctable causes of discomfort, and proceed with noninterventional symptom management if no cause can be identified.[41] An awareness of the multiple treatment modalities available for palliation of symptoms related to lung cancer can aid the clinician in obtaining timely relief for the patient, who may have very little time remaining.

Palliative Surgical Options

The most common clinical situations in patients with lung cancer that may benefit from invasive interventions include airway obstruction, hemoptysis, pleural or pericardial effusions, and brain or bone metastases. Worsening symptoms of dyspnea, hemoptysis, and stridor warrant prompt bronchoscopic evaluation for airway obstruction. Airway obstruction can be inside the airway, within the airway wall, or extrinsically compressing the airway.[43,44] Palliative bronchoscopy with the goal of alleviating symptoms can be highly effective. Bronchoscopic options for treatment include short-term endotracheal intubation, tumor debulking, balloon dilation, laser therapy,

electrocautery, cryotherapy, photodynamic therapy, argon plasma coagulation, and airway stent placement.[45] Airway obstruction can be endobronchial or extrinsic compression. When malignant central airway obstruction resulted in respiratory failure, urgent therapeutic bronchoscopy allowed 52% of patients to come off the ventilator in one study.[46] Balloon dilation is best used in conjunction with stent placement, and works best when small areas are stenosed.[47] Laser debridement and electrocautery are only effective for intraluminal lesions, but can result in immediate relief of dyspnea in 55% to 90% of patients.[48,49] Cryotherapy and photodynamic therapy are also highly effective in relieving symptoms caused by intraluminal airway obstruction, but require repeat treatment sessions with slow symptom relief.[50]

Airway stents can be used for both intrinsic and extrinsic compressing lesions, and can be used in conjunction with other techniques including balloon dilation and laser debridement. The only true contraindication to stent placement is external airway compression by a vessel, because this can result in high rates of erosion, hemorrhage, and death.[51] Airway stents are also sometimes considered for palliative management of tracheoesophageal fistulas. Tracheoesophageal fistulas carry significant symptom burden for patients (ie, aspiration or pneumonitis), along with inability to tolerate oral intake and marked reduced survival of 1 to 7 weeks.[41] Aggressive interventions, such as attempts at surgical repair or resection, should be avoided, and stenting of both trachea and esophagus has yielded only modest benefit in limited trials.[52–55] One small study of 24 patients showed that invasive treatment of endobronchial obstruction resulted in improved airway diameter in all patients and improved dyspnea in 85% of patients, but failed to show a significant improvement in QOL scores.[56]

Massive hemoptysis can be very distressing to patients, families, and physicians, and prompt bronchoscopic evaluation for possible palliative therapy can be of benefit in some cases. Hemoptysis is a second clinical scenario in which invasive procedures may palliate symptoms of lung cancer. Although physicians often define massive hemoptysis warranting intervention as greater than 200 mL in 24 hours, patients often consider small amounts of hemoptysis very concerning.[57] Otherwise healthy persons presenting with hemoptysis are candidates for open lung surgery; however, patients with lung cancer with hemoptysis often have advanced disease, which makes them poor surgical candidates, and thus may benefit from less aggressive interventions. Therapeutic bronchoscopy with balloon tamponade and infusion of vasoactive agents, such as epinephrine, may be successful as a temporizing measure.[58–62] If the area of bleeding can be directly visualized, bronchoscopic techniques, such as neodymium:yttrium-aluminum-garnet laser coagulation or electrocautery can also be used, with reported response rates of 60% to 100%.[63–65] Bronchial angiography with bronchial artery embolization can sometimes control hemoptysis.

Malignant pleural and pericardial effusions are a third common cause of dyspnea in patients with lung cancer that can also be treated with palliative interventional procedures. When a pleural effusion is found in a patients with lung cancer presenting with dyspnea, a diagnostic thoracentesis should first be done. The initial thoracentesis helps to determine if drainage relieves the patient's dyspnea and allows the lung to fully reexpand. For those with malignant pleural effusions and symptomatic improvement after thoracentesis, the recommended therapeutic options include serial thoracenteses, chest tube drainage with bedside chemical pleurodesis, surgical pleurodesis, or pleural drain catheter placement.

Repeat thoracentesis is recommended in patients with very short life expectancy, because malignant pleural effusions recur in nearly 100% of patients within 1 month of initial drainage.[40] Chemical pleurodesis carries a 50% to 95% success rate, and seems to be most successful when performed using talc, according to a recent

Cochran review.[66] Chemical pleurodesis can be done at the bedside but requires chest tube placement and a prolonged hospital stay; it can also occasionally be painful and cause pneumonitis in 4% to 8% of patients.[67] Surgical pleurodesis is slightly more successful with a 75% to 100% success rate,[41] but many patients with advanced lung cancer are unlikely to be fit surgical candidates. Chemical pleurodesis requires an expanded lung for success, and in patients who have rapidly accumulating effusions with trapped lung, these techniques are more likely to fail.

Tunneled pleural catheters have been recommended as first line for malignant pleural effusions, because they can be done as an outpatient, require only local anesthesia, and have high success rates of 85% to 95%. In 1999, Putnam and colleagues[68] conducted a trial that led to Food and Drug Administration approval of the PleurX catheter (CareFusion, San Diego, CA, USA), showing that pleurodesis with doxycycline had an average hospital stay of 6.5 days, whereas tunneled PleurX catheter placement required only 1 day.

In a recent paper advocating for tunneled pleural catheter placement as first-line treatment of malignant pleural effusions, Tremblay and colleagues[69] wrote, "the current authors estimate that 1 week in the hospital represents 5% of a patient's remaining life expectancy, time that may be more beneficial spent at home with family and friends." Recent cost-effectiveness analysis showed that tunneled pleural catheters became more cost effective when the life expectancy was 6 weeks or less.[70] The study did not account for physician inpatient fees in the pleurodesis group and assumed three nursing visits per week were needed for the indwelling catheter group; given that the patient and family can easily be taught to care for the catheter and physician fees can be costly, the cost benefit of tunneled catheters is probably more pronounced than stated.

A review of 231 catheters placed for malignant pleural effusions showed a low infection rate of 2.2%, usually limited to local cellulitis, and confirmed a high effectiveness rate, with 52 of 52 catheters placed for lung cancer still in place and functional at the time of death.[67] Malignant pleural effusions are a treatable cause of dyspnea in patients with lung cancer, and the selection of treatment method should be based on minimizing patient burden while maximizing symptom improvement and QOL.

Superior vena cava syndrome occurs in 10% of patients with lung cancer involving the right hilum.[71] Obstruction leads to a characteristic syndrome, with formation of collateral veins over the upper chest, facial swelling made worse with recumbency, headache, increased cerebral venous pressure, and in severe cases blindness and coma. Palliation of these symptoms can often be achieved with a combination of chemotherapy and radiation therapy for NSCLC.

Surgical palliation with bypass of the cava has been uncommonly performed in highly selected circumstances, but more recently endovascular stent placement by interventional radiologists has had increased success at alleviating symptoms. Case series report success rates of 94% to 95% after stent placement, and many authors advocate stent placement as the initial treatment for immediate symptom relief with fewer complication.[72–84] Although surgery is the only curative treatment approach for lung cancer, the surgeon and interventional radiologist should be considered members of the extended team for the palliation of lung cancer symptoms.

Palliative Pharmacologic Options

Medications are invariably used in the management of pain and dyspnea in patients with lung cancer. Effective pain management may not mean complete pain relief, but more likely a significant alleviation in the patient's pain by at least 33% to 50%.[85–87] Pain medications should be administered in accordance with the National

Comprehensive Cancer Network Pain Guidelines,[88] beginning with nonopioids, such as nonsteroidal anti-inflammatory drugs and acetaminophen, and continuing with the addition of opioids and adjuvants as needed. When opioids are administered, constipation should be prophylaxed against and continuously monitored. For neuropathic pain, adjuvants to analgesics, such as anticonvulsants and tricyclic antidepressants, can be very helpful. Steroids can aid in relief of symptoms caused by edema from spinal and intracranial metastases, whereas bisphosphonates can reduce pain caused by bony metastases.[89] The medication regimen should be kept as simple as possible to avoid further side effect and cost burden. The oral route of administration is preferred. When this is not possible, rectal or transdermal delivery is often feasible. For parenterally administered medication, the intravenous or subcutaneous routes should be used. Intramuscular administration has the disadvantages of increased pain with administration and unpredictable absorption. Inhaled administration of opioids is not recommended.[90]

Dyspnea in the setting of lung cancer can be attributed to five causes: (1) direct involvement of lung tissue by cancer; (2) indirect respiratory complications related to the cancer (postobstructive pneumonia and pleural effusions); (3) treatment-related complications (fibrosis secondary to chemotherapy or radiation); (4) respiratory comorbidities (pulmonary embolism); and (5) other comorbid conditions (COPD, malnutrition, and prior lung resection).[41] Pharmacologic management options include bronchodilators, corticosteroids, anxiolytics, antidepressants, opioids, and oxygen. A metaanalysis of 18 randomized controlled trials confirmed that opioids are successful in relieving dyspnea.[91] Because many patients with lung cancer also have COPD, optimizing COPD treatment can be beneficial in relieving dyspnea. A prospective study of 100 terminally ill patients with cancer, 49 of whom had lung cancer, showed that correctable causes of dyspnea included bronchospasm in 52% of patients and hypoxia in 40% of patients.[92] Inhaled bronchodilators can assist with management of bronchospasm, whereas supplemental oxygen can treat dyspnea-related hypoxia. There is some debate as to whether oxygen can also alleviate dyspnea in patients who are nonhypoxemic; for the population with advanced lung cancer, oxygen prescription should be considered for all patients who are dyspneic regardless of oxygenation status, because it may improve exercise tolerance,[93] and should not be delayed awaiting painful serial blood gases to confirm hypoxemic status.

Cough is a complaint seen in the initial presentations of more than 65% of patients with lung cancer.[94] In addition to treatment for correctable causes of cough, pharmacologic therapies that may be of benefit include cough suppressants, bronchodilators, and opioids. Codeine is a popular and effective choice of opioid for suppressing this symptom. Medical management of comorbid conditions contributing to cough, such as COPD, gastroesophageal reflux, and congestive heart failure, can also be of benefit.[95]

When death is imminent, oral and respiratory secretions become salient symptoms. It is important to separate the nursing concerns of frequent suctioning, the family concerns of chest crackles, and the true symptoms of dyspnea or cough sensed by the patient. Although opioids are the most successful agents for management of dyspnea, anticholinergic agents, such as scopolamine and glycopyrrolate, are preferred for control of copious secretions. Such symptoms as pain and dyspnea that do not respond to initial therapy should prompt referral to palliative care and pain management specialists, from the time of presentation until the last days of life.

Palliative Chemotherapy

Palliative chemotherapy may increase survival, and in some cases can improve pain and other symptoms.[96–100] Palliative chemotherapy means chemotherapy given

primarily for rapid relief of symptoms, not noncurative chemotherapy. Dyspnea related to pulmonary parenchymal toxicity from chemotherapy should be managed with discontinuation of the chemotherapeutic regimen and institution of steroids. This is a delicate balance in using chemotherapy to the full extent possible to relieve symptoms and reverse the underlying disease while also monitoring closely to determine when the chemotherapy may be adding to symptom burden and thus should be discontinued.[101]

Palliative Radiation

Palliative radiation therapy can be used throughout the course of lung cancer, before surgery, along with chemotherapy, or as an independent treatment modality. Radiation therapy can be used as primary treatment of a lung cancer in settings where surgery is not indicated, because of location of tumor, advanced stage, comorbidities, or patient preference. Radiation therapy can be of palliative benefit to alleviate pain and neurologic deficits from brain and spinal metastases, relieve pain from bone metastases, and prevention of impending pathologic fracture. Finally, radiation can also be given by way of interventional bronchoscopy as intraluminal brachytherapy to help control hemoptysis and airway obstruction by central tumors.

Radiation therapy has a wide spectrum of complications, depending on site, dose, method of dosing, and comorbid conditions. Although it is very uncommon for patients to die as a complication of radiation therapy, radiation pneumonitis can cause cough, shortness of breath, and even death in a small percentage of patients. Spontaneous rib fractures can occur after a radiation treatment of the chest. Radiation-induced mucositis, esophagitis, and skin changes are common complications, and the effect of radiation therapy on the heart and lung can combine with loss of function secondary to comorbid conditions and lung resection to impair cardiorespiratory function.[102]

Other Palliative Management Options

The broad term of "supportive care" for patients with advanced lung cancer can include a variety of medical, psychological, and alternative therapies, all of which can aid in the palliation of symptoms. One medical example is the use of blood transfusions, which can alleviate fatigue and dyspnea associated with anemia, and improve QOL.[103] Interventions, such as guided imagery, breathing techniques, and educational tools, can have a positive impact on common psychologic symptoms, such as anxiety and depression that undermine QOL. Finally, the involvement of social and spiritual support for patients and families cannot be underestimated, and can certainly impact physical symptoms and overall QOL. The task of integrating palliative surgical, medical, and psychosocial care for the management of a patient with advanced lung cancer requires an interdisciplinary team, with all members of the team focused on how best to provide relief of suffering and the best QOL possible for the patient's remaining years, days, or hours.

A Model for Integrating Palliative Care in Lung Cancer

Fig. 2 provides details on a model to improve palliative care for patients with lung cancer and their family caregivers. This model was developed based on extensive pilot work by the authors.[104,105] In our interdisciplinary palliative care model, a comprehensive assessment of patient and family caregivers' QOL concerns before treatment initiation begins this process of care. QOL assessment is focused on four domains: (1) physical, (2) psychological, (3) social, and (4) spiritual well-being. After the comprehensive QOL assessment, an interdisciplinary care team meeting is scheduled and

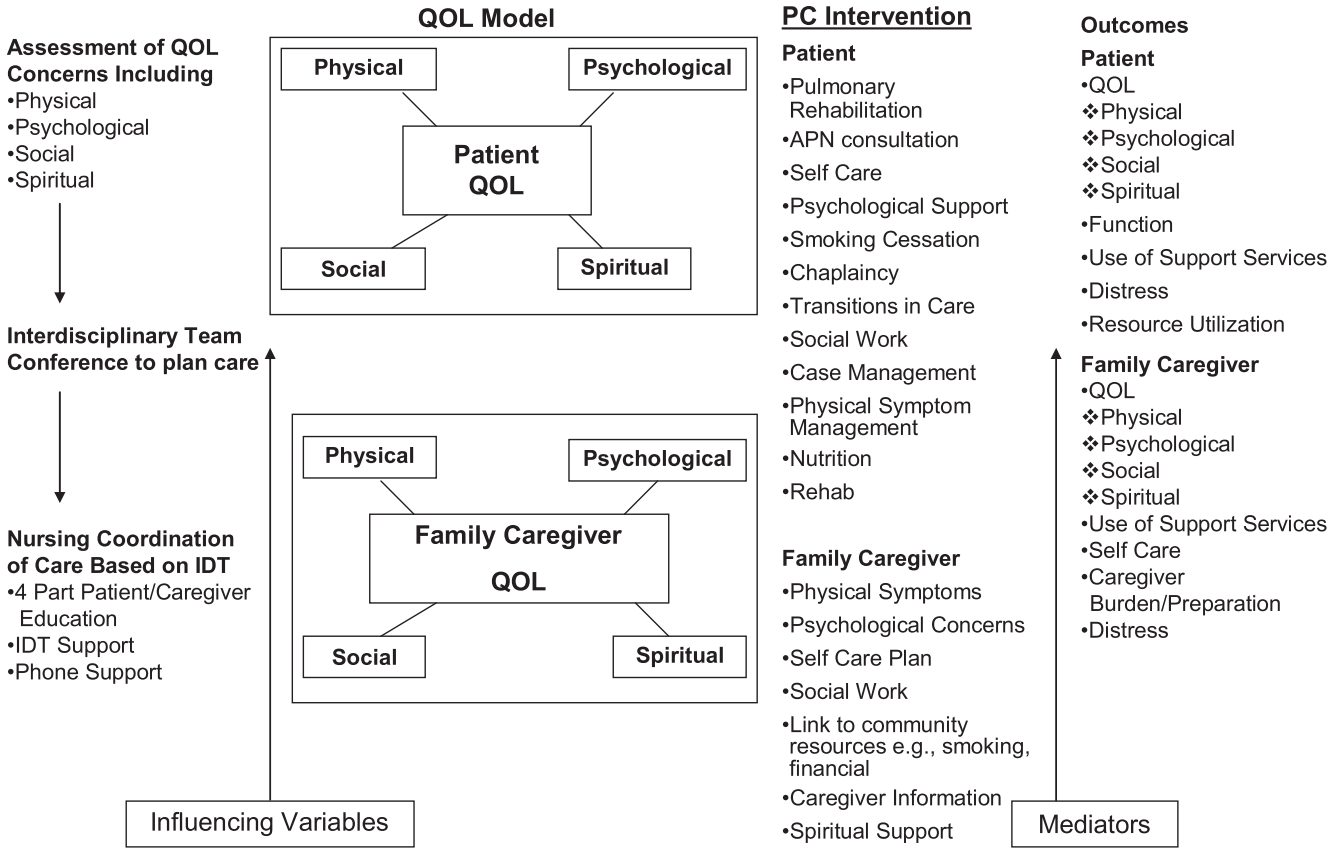

Fig. 2. A model of care for patients with lung cancer and family caregivers. APN, advance practice nurse; IDT, interdisciplinary team.

initiated. The team should include the patient's treating physicians; nurses involved in patient care; and supportive care experts, such as social workers, psychologists, spiritual counselors, pulmonary rehabilitation specialists, case managers, pain specialists, and dietitians. Together as an interdisciplinary team, the patient's QOL assessment, which includes physical, psychological, social, and spiritual dimensions, are discussed, and a care plan is produced to address each of the issues. Nursing coordination of care is initiated based on the recommendations of the team, and includes patient and caregiver education, support from the team members, and referrals to supportive care services. Patient and family caregiver outcomes to be measured should include QOL; functional status; use of support services; distress; use of resources; and family caregiver self-care, burden, and skills preparedness.

Initial pilot studies and the development of the model at the City of Hope led to the design of a 5-year program funded by the National Cancer Institute to test the effectiveness of the interdisciplinary palliative care model to improve care for patients with lung cancer and their family caregivers. Consistent with the recommendations of the Institute of Medicine Report on palliative care,[106] it is believed that palliative care, including symptom management and attention to QOL concerns of patients and families, should be addressed throughout the trajectory of lung cancer. Three simultaneous projects are included within the program project. Project 1 is early stage lung cancer, and provides a model of integrating palliative care throughout the trajectory of disease. Project 2 focuses on late-stage lung cancer, a population that has decreased survival and high QOL and symptom concerns. Project 3 focuses on family caregivers of patients with lung cancer.

SUMMARY

Lung cancer continues to be the second most common cancer in the United States with over 157,000 patients expected to die from the disease this year.[1] Advancements in the surgical and medical treatment of lung cancer have resulted in more favorable short-term survival outcomes. Treatment, however, can be complex, and long-term survival with the most current, cutting-edge technologies remains elusive. After initial treatment, lung cancer requires continued surveillance and follow-up for long-term side effects and possible recurrence. The integration of quality palliative care into routine clinical care of patients with lung cancer after surgical intervention is essential in preserving function and optimizing QOL through survivorship. An interdisciplinary palliative care model can effectively link patients to the appropriate supportive care services in a timely fashion.

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