

WORKING SESSION 2A: CANCER UPDATE

EARLY DIAGNOSIS AND TREATMENT IN LUNG CANCER: CAN THE PRIMARY CARE PROVIDER MAKE A DIFFERENCE?

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INTRODUCTION

Lung cancer screening is pivotal to the early diagnosis and treatment of lung cancer, yet it is a topic that evokes much controversy for several reasons. Although we know that primary lung cancer is one of the most harmful solid tumors with respect to mortality and survival,¹ there are still organizations that do not support lung cancer screening, eg, the American Cancer Society, the American Thoracic Society, and the American Lung Association. In addition, the National Cancer Institute has concluded that lung cancer screening has no survival benefit.^{2,3} However, there have been studies, conducted by experts in the field of lung cancer, which have shown that screening for lung cancer can improve the 5-year survival rate.

Lung cancer screening is currently practiced in Japan and in northern Europe. So why is the National Cancer Institute (NCI) unsupportive of lung cancer screening? Their recommendations are based on research performed in the 1970s and 1980s.⁴⁻⁸ In one study the NCI enrolled more than 10,000 patients into a randomized controlled study from cancer treatment centers around the country. However, in taking a retrospective look at the study, it is clear that the methodology was not well designed. Subjects in the study were all men older than age 45 and only one criteria existed for enrollment: a subject had to have only smoked 20 cigarettes a day for the one year prior to being

enrolled.⁴ The study did not take into account ethnic group or gender, although members of some ethnic groups and women have seen a rise in the incidence of lung cancer. In addition, the study did not account for prior tobacco use and other risk factors. The participants were divided into 2 groups: one group had a chest x-ray and sputum cytology every 4 months, and the other had a chest x-ray and sputum cytology once a year, which was the standard of care at that time.

In this poorly designed study, researchers focused on the finding that there were more cancer deaths in the screening groups. However, they ignored the finding that the 5-year survival rate in the screening group was significantly higher compared to the control group, 33% vs 15%, respectively.⁴ During that era, the average 5-year survival was 13%. Thus, dating back to the 70s and 80s, the National Cancer Institute did find an improvement in 5-year survival rates when a screening program was implemented. Most patients and physicians would gladly accept an improvement in their 5-year survival rates.

How can the primary care provider make a difference? They can make a difference by knowing the answers to these following questions:

- How bad is this lung cancer epidemic?
- What are the best methods for screening for lung cancer?
- Which patients are high-risk enough to warrant screening?

- What is the role of the primary care provider once the diagnosis of cancer has been made?

THE EPIDEMIC

Table 1 provides some interesting, and often little known, facts about the lung cancer epidemic. The characteristics of this lung cancer epidemic have been published,^{19,20} but seem to receive little notice. The National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) study published data from 1.8 million patients who had a primary solid cancer.¹ The study followed the patients from 1988 to 1997 and characterized the types of cancer and differences among sexes and ethnic groups. The cancer with the worst prognosis was lung cancer, and for both sexes there were disparities between ethnic groups. Both men and women who were African-American, Alaskan, and Native American had a significantly worse survival than non-Hispanic Whites. Women experienced a rise in the incidence of lung cancer without a rise in survival. Despite these findings, lung cancer is not considered a woman's health issue, nor have there been large investigations to determine if ethnicity is a risk factor.

DATA SUPPORTING EARLY DIAGNOSIS AND SCREENING

Naruke et al studied approximately 2,400 people who received surgery for cancer tumors and followed the survivors over a timeline post resection. This study, and other subsequent ones, found that the lower the surgical stage, the better the 5-year survival rate. Once lung cancer reaches the later stages of 3a, 3b, or 4 the survival is well under 50% at 5 years.⁹

In Japan, where there is a high prevalence of people who smoke, aggressive screening by sputum cytology and ra-

Lung cancer facts

1. There are approximately 170,000 new cases of lung cancer diagnosed each year.
 2. Although smoking cessation efforts have been successful, lung cancer survival has not changed in the past 30 years.
 3. In the United States, there are more than 100 million smokers and ex-smokers who are at-risk for lung cancer.
 4. Fifty percent of the new cases are found in ex-smokers, which is contrary to popular belief.
 5. Lung cancer is the #1 cancer cause of death in women.
 6. More Americans will die this year from lung cancer than AIDS. However, in the news we hear about HIV, West Nile virus, and other cancers, but lung cancer will kill more.
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diographic imaging was conducted.¹⁰ These procedures were conducted over a 15-year period, utilizing either chest x-rays or low-dose spiral computed tomography. In the screened patients, they found the 5-year survival rate increased from 33% to 58%. A similar study, performed in the United States, showed that when you can detect cancer early and the patients have curative resection, the 5-year survival rate increased to 74%. Furthermore, if patients did not have curative surgery but had surgery followed by radiation therapy, their 5-year survival rate increased about 57%.¹¹ Even the NCI study, back in the 70s and 80s, showed that screening did benefit 5-year survival rates in lung cancer patients.

HOW TO SCREEN

Think of screening as finding lung cancer where it grows: in the airways, the parenchyma, and in the lymph nodes. Screening methods used must be able to detect cancer growth in these areas. If we rely on history and physical alone, by the time the patient becomes symptomatic with dyspnea, persistent cough, or hemoptysis, he (or she) will usually have advanced stage lung cancer that is not resectable.

One study by Sobue et al compared chest radiographs, low-dose spiral CT, and sputum cytology to see which works best, either alone and in combination. They found that 3.4% of the patients with abnormal lesions on chest radiographs had lung cancer, while 11.5% of abnormal lesions found with low-dose spiral CT were positive for lung cancer. Sputum cytology detected cancer in only .8% of the abnormal lesions.¹² With such a low detection rate, why use sputum cytology? It is less invasive and more cost-efficient than bronchoscopy, which is the gold standard for airway examination. Furthermore, chest radiographs and CT scans are not reliable methods for examining the airways.

Data from the University of Colorado¹³ showed that when a combination of pooled sputum cytology and spiral CT was used to screen for lung cancer, it was possible to detect malignancy in 2% to 3% of those who were screened. Although this may seem like a small number, 72% of these patients were in stage 1 cancer development and thus, were candidates for curative surgery. Furthermore, there is no significant difference between screening every 6 months or yearly.

For the primary care physician, another method of screening, spirometry, can be used to identify those who are at-risk of lung cancer, ie, those with chronic obstructive pulmonary disease. In the past, physicians had to purchase spirometry equipment that was expensive and required extensive training to use. With today's technology, a spirometer can plug into your laptop's PC card, information can be loaded, and the equipment can be running in a short period of time. Insurance companies recognize that the degree of airflow obstruction correlates with the risk of developing lung cancer and will reimburse for this type of screening and some of the subsequent studies stemming from it.

WHO SHOULD UNDERGO LUNG CANCER SCREENING?

To answer this question, the primary care provider has to be aware of the risk factors for lung cancer. Cigarette smoking does increase the risk of developing lung cancer. However, using a positive tobacco use history alone would mean that approximately 100 million people should be screened. Thus, the amount and length of tobacco use must be used to further characterize the risks. Individuals who smoke 30 or more packs of cigarette a year are at significant risk of lung cancer. However, the risks do not significantly change for individuals who smoke between 30 and 120 packs/year. Once above 120-pack years, there is a significant increase in risks.

Family and occupational histories are extremely important. Smaller studies have suggested a genetic predisposition for the development of lung cancer in family members who have a strong family history of lung cancer.¹⁴⁻¹⁵ Occupational exposure history is also important, not only the exposure of the patient, but also of family members. For example, there are cases reported where the wives of husbands who worked with asbestos developed significant exposures simply by washing their husbands' clothes.¹⁶

Merely setting the focus of screening on those with tobacco use histories or any other single risk factor will result in an extremely large population that would require testing. This would have a negative impact on healthcare cost and the efficiency of lung cancer screening. The key to successful screening will be identifying extremely high-risk patients that warrant screening, ie, those with multiple risk factors. This would require the primary care provider to have full knowledge and understanding of the risk factors.

Based on the literature and the trends we have seen, other risk factors for lung cancer to assess include:

1. **Ethnicity:** Because ethnic groups have a higher incidence and death rate related to lung cancer, we must pay more specific attention to ethnicity of our patients.
2. **Women:** Lung cancer is now the leading cause of cancer deaths in women, greater than breast and ovarian cancers. This, along with the rise in lung cancer rates in women over the last few decades, should direct us to focus on screening women as aggressively for lung cancer as we do for breast cancer.
3. **History of lung cancer:** We know that about 15% of patients, who have had a resection or treatment for lung cancer, will develop another malignancy.¹⁷ We also know that, the development of lung cancer, from metaplastic changes to detectable carcinoma in situ, takes between 5 to 10 years. Although we call a new lesion "recurrent cancer," there is a chance that the new tumor was already growing. Perhaps some poor survival rates are because, after the diagnosis and treatment are completed, we forget to recognize that these patients are still at high risk and require continued screening.
4. **History of dysplasia:** This means that the process of malignant transformation has begun and that there is a high risk for those dysplastic cells to grow into a malignancy.

WHAT IS THE PRIMARY CARE PROVIDER'S ROLE AFTER THE DIAGNOSIS IS MADE?

Once the cancer diagnosis has been made, the roles of the surgeons, oncologists, radiation oncologists, and other specialists will increase, with the potential of the primary care physician's role decreasing. However, sub-specialists recognize the value of the primary care provider's personal contact and long-term relationship with the patient.

Thus, the primary care provider may be better suited to discuss quality of life and end-of-life issues with the patient, especially if there is a poor prognosis associated with the diagnosis.

The primary care physician can be instrumental in patient behavior and compliance. For example, while a physician should always encourage smoking cessation, it is particularly important for patients diagnosed with lung cancer. Smoking cessation after the diagnosis of lung cancer does not affect the risk of recurrence; however, in some patients accomplishing smoking cessation is a moral triumph. A moral triumph for patients with such an emotionally devastating diagnosis as lung cancer can be beneficial.

Physicians can also assist in setting up support systems for the patient and family; support groups, mentors, or other cancer survivors may be helpful to the patient. Assist the patient with obtaining information on their disease or understanding information given to them by specialists. Most importantly, ensure that their symptoms are being controlled.

Some studies that suggest that consuming a low-fat diet and anti-oxidants limits the chance of recurrence or progression of the disease.¹⁸ However, good nutrition is important for another reason. Cancer patients will most likely have chemotherapy, surgery, and/or radiation therapy; they need to be nutritionally ready for these treatment approaches.

As necessary by the patient's prognosis, end-of-life discussions and decision-making should occur early, allowing the treatment team and family to have an idea of how to proceed if treatment is unsuccessful. Again, the primary care physician may maintain the most respected relationship with the patient to engage in these conversations.

Finally, primary care physicians should have knowledge of new treatment options, especially for palliation. For example, at the Morehouse School

of Medicine, new interventional procedures are available to restore patency to obstructed airways and drain post-obstructive infections. Although improvement in survival has been directly linked to early detection, successfully treating complications after diagnosis may also contribute to improving survival.

In summary, the primary care provider can make a difference if he or she: 1) recognizes lung cancer as an epidemic; 2) learns to identify patients at high-risk for developing lung cancer; 3) knows how to effectively screen for lung cancer in a cost-efficient manner; and 4) focuses on the quality of life during and after treatment.

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INTERNET INFORMATION RESOURCES

Lung Cancer Online
www.lungcanceronline.org

Medicine Online
www.meds.com/lung/lunginfo.html

It's Time to Focus on Lung Cancer
www.lungcancer.org

National Cancer Institute Cancer.gov
www.nci.nih.gov/cancerinfo/wyntk/lung

National Cancer Institute: PDQ Cancer Information Summaries
www.cancer.gov/cancerinfo/pdq/screening