



## **LUNG CANCER SCREENING: CLINICAL DATA TO ASSIST PATIENT DECISION-MAKING**

### **Screening for Lung Cancer**

Lung cancer is the most common cause of death due to cancer in both men and women. About 80% of lung cancers are caused by smoking. The most important way to reduce the risk of lung cancer is to stop smoking. Screening with low-dose computed tomography (LDCT) scan for lung cancer is available for patients with lung cancer risk due to smoking. Lung cancer screening is currently not available for patients that have other risk factors (e.g., asbestos, radon) without a smoking history.

### **Benefits of Screening**

Screening for lung cancer with LDCT can reduce the risk of lung cancer among those with a history of heavy smoking. LDCT scans are a type of x-ray that takes detailed pictures of the lungs. The goal of lung cancer screening is to detect lung cancers early when they can be cured by surgery.

In the National Lung Screening Trial, annual LDCT screening among heavy smokers reduced the risk of lung cancer death by 20% and death from any cause by 7% over a three-year study period.<sup>1</sup>

### **US Preventive Services Task Force and Centers for Medicare & Medicaid Recommendations**

The US Preventive Services Task Force (USPSTF) recommends annual screening for lung cancer with LDCT in adults aged 55 to 80 years who have a 30 pack-year smoking history and currently smoke or who quit smoking in the past 15 years.<sup>2</sup> Screening should be discontinued when a patient has not smoked for 15 years or develops a health problem that significantly limits life expectancy or the ability or willingness to undergo curative lung surgery. The Centers for Medicare & Medicaid (CMS) recommends LDCT screening with the same criteria but only up to age 77. CMS also requires shared-decision making counseling between a patient and their healthcare provider.<sup>3</sup>

### **Harms of Screening**

**False-positive results** are common with LDCT screening. LDCT screening detects pulmonary nodules in about 20% of screens.<sup>3</sup> Most require follow-up diagnostic imaging; a small minority (1-2%) requires invasive biopsy. Over 95% of screen-detected nodules are ultimately found to be benign. Patients undergoing diagnostic evaluation of pulmonary nodules may experience anxiety. Rarely patients may experience serious or lethal complications of invasive biopsy.

**Over-diagnosis** is a likely harm of LDCT screening. Over-diagnosis is the detection and treatment of cancers that would never come to clinical attention in the absence of screening. Long-term follow-up of the clinical trials will elucidate the extent of over-diagnosis that occurs with LDCT screening.

**Radiation exposure** from LDCT screening (and associated diagnostic studies) may cause some cancers that would not arise in absence of screening, but estimates suggest that in a high-risk population, the benefits of screening outweigh the radiation risks.<sup>4</sup>

### **Uncertainties**

Guidelines suggest annual screening, but no studies have evaluated long-term annual screening. Clinicians should discontinue screening or not screen at all in patients with limited life expectancy or who are not candidates for curative lung surgery based on physical condition.

### **Discussing Benefits and Harms with Patients**

It is important that clinicians assess patients carefully as candidates for LDCT screening based on: age (55-80 years), smoking history (30 pack-year, currently smoking or quit within the last 15 years), and health status (asymptomatic, willing and able to undergo curative surgery or alternative therapy). Patients should consider both the benefits of screening and potential harms before making a screening decision. Each patient will view the pros and cons of screening differently. Clinicians must offer all current smokers counseling for smoking cessation.

### **References**

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2. Moyer VA. Screening for lung cancer: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med.* Mar 4 2014;160(5):330-338.
3. Centers for Medicare and Medicaid Services. Decision Memo for Screening for Lung Cancer with Low Dose Computed Tomography (LDCT) (CAG-00439N). [http://www.cms.gov/medicare-coverage-database/details/nca-decision-memo.aspx?NCAId=274&NcaName=Screening+for+Lung+Cancer+with+Low+Dose+Computed+Tomography+\(LDCT\)&TimeFrame=7&DocType=All&bc=AQAAIAAAgAAAA%3d%3d&](http://www.cms.gov/medicare-coverage-database/details/nca-decision-memo.aspx?NCAId=274&NcaName=Screening+for+Lung+Cancer+with+Low+Dose+Computed+Tomography+(LDCT)&TimeFrame=7&DocType=All&bc=AQAAIAAAgAAAA%3d%3d&). Accessed March 23<sup>rd</sup>, 2015.
4. Bach PB, Mirkin JN, Oliver TK, et al. Benefits and harms of CT screening for lung cancer: a systematic review. *JAMA.* Jun 13 2012;307(22):2418-2429.