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Lung Cancer Screening

An APCCMPD Ambulatory Care Curriculum Teaching Script

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Lung Cancer Screening

Scenario 1:

Ms. Jones is a 65-year-old woman with a history of hypertension and a recent diagnosis of Chronic Obstructive Pulmonary Disease (Forced Expiratory Volume in 1 second [FEV1] 72% of predicted) who is referred to your office for further management. She is currently taking tiotropium once daily and albuterol as needed, with significant improvement in her dyspnea. She currently denies any exercise limitations and uses her albuterol rescue inhaler rarely. She reports smoking 1 pack of cigarettes per day since the age of 16. She denies any cough, chest pain, pleuritic pain, or change in weight. There is no personal history of cancer or family history of lung cancer. She is currently not interested in smoking cessation as she has been stressed about the recent death of her mother. She read recently about lung cancer screening and is curious to learn more about it.

Question 1:
The USPSTF recommends LCS for select patients. What are the current recommendations? Does Ms. Jones meet the eligibility criteria for LCS based on those recommendations?

Question 2:
Ms. Jones wants to know why doctors are recommending this new screening test when no one recommended it previously. She had heard about colonoscopies for colon cancer screening and mammograms for breast cancer screening but never heard of LDCTs for lung cancer screening. What do you share with Ms. Jones in terms of the rationale for these recommendations?

Question 3:
Although Ms. Jones meets eligibility criteria, it is important to have a conversation regarding the risks and benefits of screening. What do you think are some of the key elements to include in a conversation about screening for lung cancer using LDCT?

Question 4: Ms. Jones asks who would be following up on the results of the annual screening? What are the differences between centralized and decentralized LCS programs?

Question 5:
Ms. Jones is retired and has Medicare as her main insurance. She is concerned that she will have to pay for the LDCT scan. What would be your recommendation? Are there LCS eligibility criteria defined by CMS?

Question 6:
What is the most commonly used structured reporting system for low-dose CT lung cancer screening?

Question 7:
Ms. Jones' initial LDCT was considered Lung-RADS 1. She undergoes several additional screening CTs through the years, all of which are "negative." At what point would you discontinue LCS?

Lung Cancer Screening

Educational Objectives:

1. Review the benefits, risks, and indications of low-dose CT scan (LDCT) for lung cancer screening (LCS)
2. Understand the eligibility criteria for enrollment in LCS, dictated by the Centers of Medicare and Medicaid Services (CMS), and how it differs from the U.S. Preventive Services Task Force (USPSTF) recommendations
3. Review of the Lung-RADS reporting system for lung cancer screening

Scenario 1:

Ms. Jones is a 65-year-old woman with a history of hypertension and a recent diagnosis of Chronic Obstructive Pulmonary Disease (Forced Expiratory Volume in 1 second [FEV1] 72% of predicted) who is referred to your office for further management. She is currently taking tiotropium once daily and albuterol as needed, with significant improvement in her dyspnea. She currently denies any exercise limitations and uses her albuterol rescue inhaler rarely. She reports smoking 1 pack of cigarettes per day since the age of 16. She denies any cough, chest pain, pleuritic pain, or change in weight. There is no personal history of cancer or family history of lung cancer. She is currently not interested in smoking cessation as she has been stressed with the recent death of her mother. She read recently about lung cancer screening and is curious to learn more about it.

Question 1: The USPSTF recommends LCS for select patients. What are the current recommendations? Does Ms. Jones meet the eligibility criteria for LCS based on those recommendations?

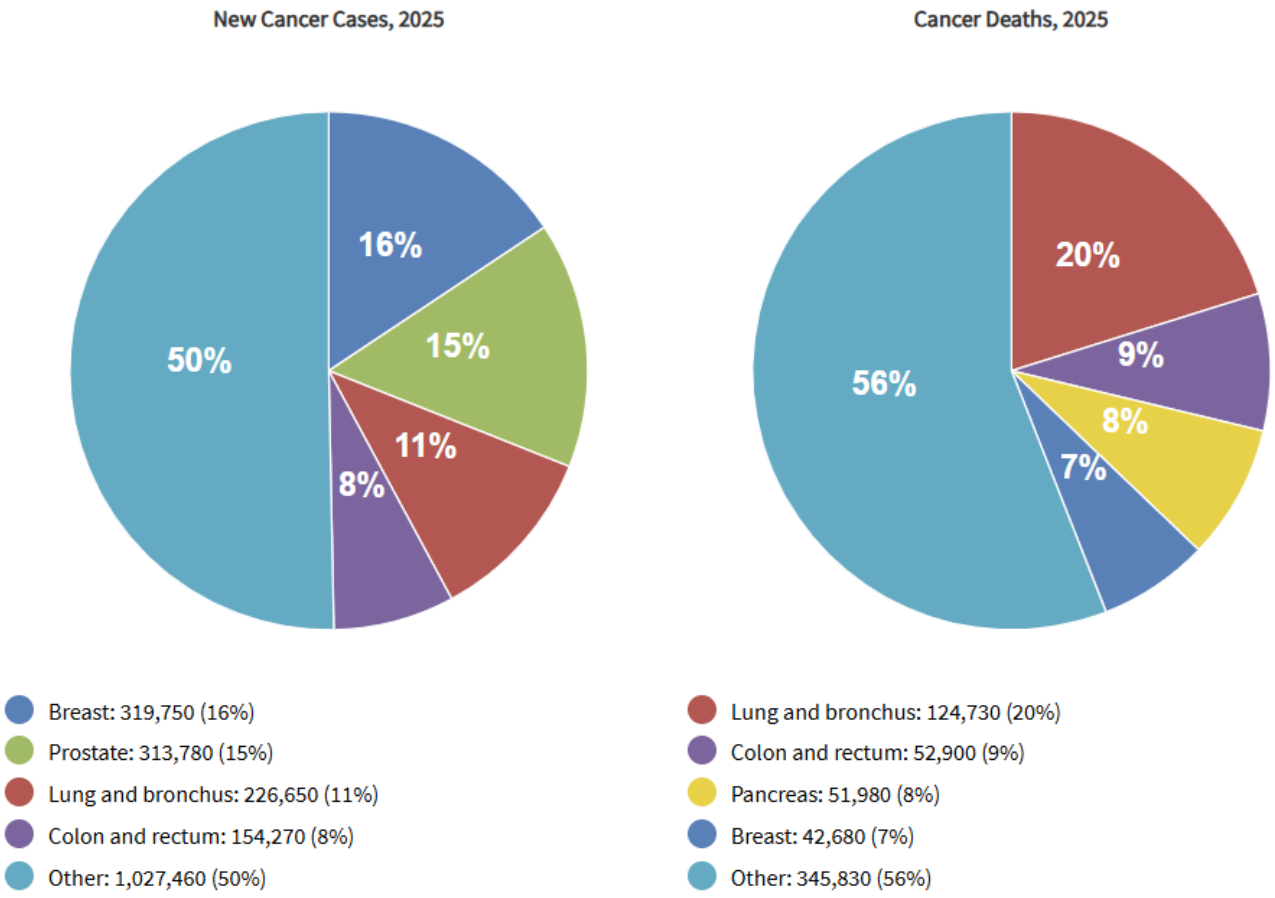
The latest USPSTF (2021) recommends LDCT for LCS in adults aged 50-80 who have a 20 pack-year (or greater) smoking history and currently smoke or have quit within the past 15 years. Screening is not recommended for individuals with functional status or comorbidity that would prohibit curative-intent therapy.

Several other professional societies and advocacy groups have endorsed annual screening for high-risk smokers and former smokers (ATS 2018, Mazzone 2021, NCCN 2025). Although the eligibility criteria differ across guidelines, a systematic review by Jonas et al. (2021) emphasizes that screening should be performed in experienced centers and that potentially eligible participants should engage in shared decision-making before enrollment/screening. Ms. Jones is a current smoker within the recommended age range and has a 49 pack-year smoking history; thus, she meets the USPSTF eligibility for LCS.

Question 2: Ms. Jones wants to know why doctors are recommending this new screening test when no one recommended it previously. She had heard about colonoscopies for colon cancer screening and mammograms for breast cancer screening but never heard of LDCTs for lung cancer screening. What do you share with Ms. Jones in terms of the rationale for these recommendations?

As shown in Figure 1, lung cancer is the third most common cancer and the leading cause of cancer-related death in both men and women in the United States.

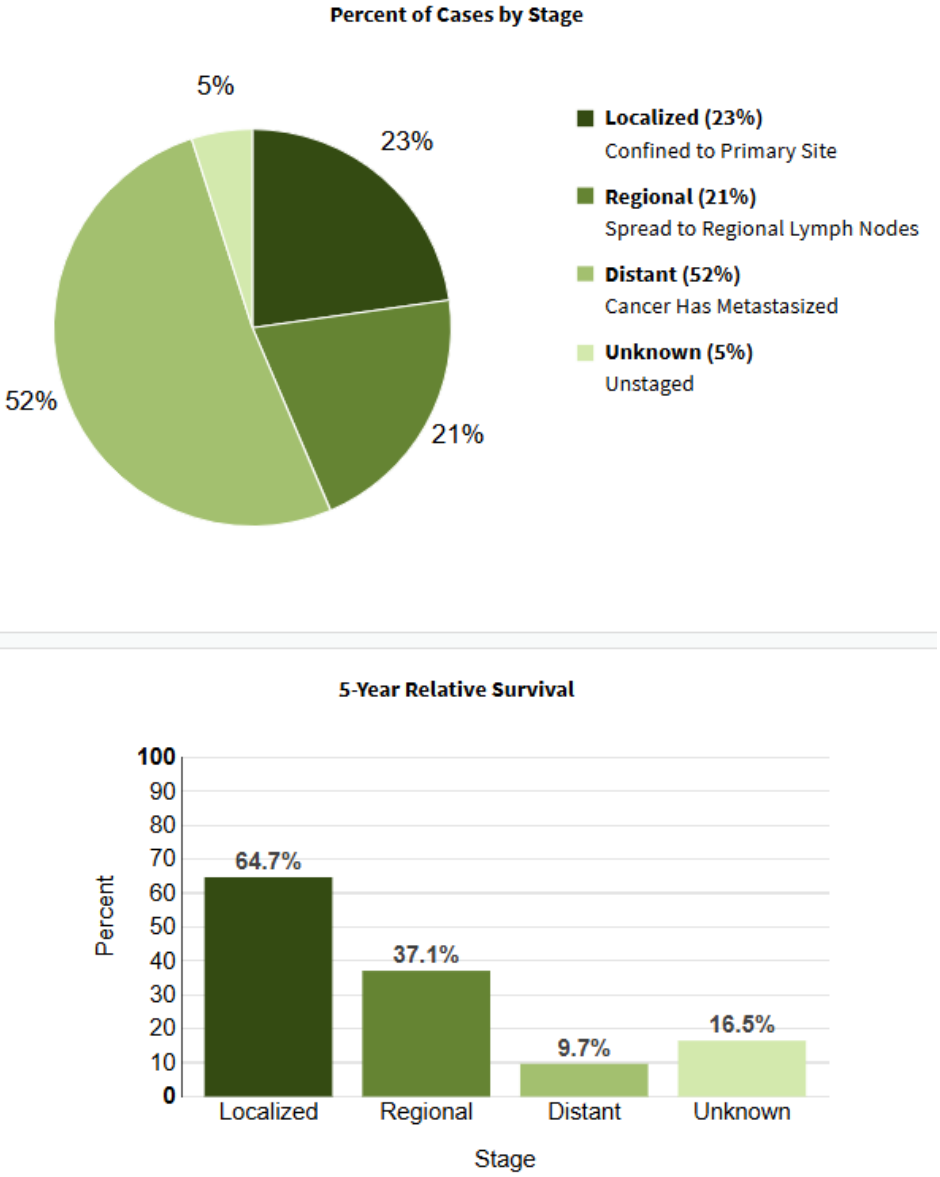
Figure 1. Distribution of New Cancer Cases and Cancer Deaths in 2025



Source: Common Cancer Sites - Cancer Stat Facts. (n.d.). SEER. https://seer.cancer.gov/statfacts/html/common.html

Lung cancer has a poor prognosis, with an overall observed five-year relative survival of 28.1% as of 2015-2021 (SEER: https://seer.cancer.gov/statfacts/html/common.html). However, early-stage lung cancer has a better prognosis and is more amenable to treatment, as depicted in Figure 2. By enabling earlier detection and treatment, lung cancer screening can give patients a greater chance of a cure.

Figure 2. Incidence of Lung Cancer by Stage at the time of Diagnosis (2015-2021) and Respective 5-Year Relative Survival



Source: *Cancer of the Lung and Bronchus - Cancer Stat Facts*. (n.d.). SEER. https://seer.cancer.gov/statfacts/html/lungb.html

The National Lung Cancer Screening Trial (NLST 2011) is the largest randomized controlled trial of LCS to date (n = 53,454) conducted at 33 U.S. centers. Participants were 55-74 years old, with a smoking history of at least 30 pack-years (former smokers had to have quit within the previous 15 years). Patients were randomized to annual LDCT versus annual chest x-ray for three years. Screening with LDCT reduced lung cancer mortality by 20% and overall mortality by 6.7%. The absolute risk of lung cancer death was reduced from 1.66% to 1.33%, corresponding to a number needed to screen of 320.

Randomized controlled trials and modeling studies from Cancer Intervention and Surveillance Modeling Network (CISNET 2021) provided additional evidence supporting the benefit of screening for lung cancer with LDCT in those aged 50 to 55 years old and with a lesser smoking history.

Perhaps the most significant impact of the updated USPSTF (2021) LCS guidelines is that the inclusion of younger smokers and those with a lower smoking exposure increases the number of women and racial/ethnic minorities who qualify for screening. This observation led to an adjustment in the annual screening guideline to include those aged 50-80 years with a minimum of 20 pack-year smoking history who either currently smoke or quit within the past 15 years. This change increased the relative percentage of persons eligible for screening by 87% overall— 78% in non-Hispanic White adults, 107% in non-Hispanic Black adults, and 112% in Hispanic adults compared with the 2013 USPSTF criteria.

According to estimates by the USPSTF (2021), this new strategy would reduce mortality by 13.0% compared to 9.8% when applying the prior criteria. Furthermore, these changes would avoid more lung cancer deaths (503 vs. 381) and result in more life years gained (6,918 vs. 4,882 per 100,000 persons) in the population aged 45 to 90 years over the lifetime of screening.

Question 3: Although Ms. Jones meets eligibility criteria, it is important to have a conversation regarding the risks and benefits of screening. What do you think are some of the key elements to include in a conversation about screening for lung cancer using LDCT?

1. Annual LDCT screening in high-risk smokers and former smokers is at least as effective in reducing lung cancer-related mortality as annual mammography is in decreasing breast cancer-related deaths among women (NLST 2011).

2. Among high-risk smokers and former smokers, screening with LDCT prevents one in five deaths from lung cancer (de Koning 2020).

3. LCS is not a single test. It is a process that involves annual testing and follow-up of detected abnormalities (Bade 2018).

4. False positive test results occur in approximately one in five LDCT screening exams. LCS has an approximate number needed to harm of 59. Most false positive results will require follow-up with one or more subsequent CT scans, but a minority (11% of all false positives) will require an invasive procedure (Jonas 2021). There are important considerations regarding the risks of screening. Across all three rounds of screening in the NLST (2011), 39% of participants in the LDCT group had at least one positive result, with more than 96% being false positives. However, only a minority of patients underwent invasive tissue sampling.

5. LCS is not a substitute for smoking cessation. Smoking cessation is the most effective way to reduce the risk of death from lung cancer. It also has other important clinical impacts on cardiovascular and respiratory health (ATS 2018).

6. The harms associated with LCS include false-positive results leading to unnecessary tests and invasive procedures, incidental findings, short-term increase in distress due to indeterminate results, overdiagnosis, and radiation exposure (Jonas 2021). Other things to consider are the psychological distress associated with uncertainty, overdiagnosis of lung cancer, and risk of radiation exposure (Jonas 2021).

Question 4: Ms. Jones asks who would be following up on the results of the annual screening? What are the differences between centralized and decentralized LCS programs?

LCS programs are either centralized or decentralized (de Koning 2020). Centralized programs use dedicated staff, such as nurse navigators, to manage patient identification, shared decision-making, imaging, follow-up, and adherence tracking. Decentralized programs rely on individual clinicians to handle these tasks without dedicated infrastructure.

A recent meta-analysis by Ezenwankwo (2025) reviewed data from 12 cohort studies involving over 17,000 individuals with negative baseline LDCT results. While overall adherence was low for LCS, centralized programs achieved a pooled adherence rate of 68.9%, significantly higher than 37.1% in decentralized settings.

Question 5: Ms. Jones is retired and has Medicare as her main insurance. She is concerned that she will have to pay for the LDCT scan. What would be your recommendation? Are there LCS eligibility criteria defined by CMS?

The CMS eligibility criteria (NCA 2022) for beneficiaries to undergo LCS are as follows (all are required):

- Age 50 – 77*
- Asymptomatic (no signs or symptoms of lung cancer)
- Tobacco smoking history of at least 20 pack-years (one pack-year = smoking one pack per day for one year; 1 pack = 20 cigarettes)
- Current smoker or have quit smoking within the last 15 years
- Receive an order for lung cancer screening with LDCT

(*) The upper age limit of 77, rather than 80 as recommended by USPSTF, was deliberately chosen by CMS, citing a lack of supportive empirical data in patients aged 78-80. However, more recent evidence further supports screening up to 80, and CMS criteria may evolve in the future to include this in future criteria.

Furthermore, assuming the above criteria are met, the beneficiary must undergo counseling using SHARED DECISION MAKING prior to the initial LDCT screening. This discussion must be documented in the medical records and include:

- The use of one or more decision aids (example: ScreenLC at screenlc.com).
- Counseling on the importance of adherence to annual lung cancer LDCT screening, the impact of comorbidities, and the ability or willingness to undergo diagnosis and treatment.
- Counseling on the importance of maintaining cigarette smoking abstinence if a former smoker, and the importance of smoking cessation if a current smoker, in addition to providing information about tobacco cessation interventions.

The radiologist involved in the reading of the LDCT screening must have a board certification from the American Board of Radiology, and lung cancer screening with LDCT must be performed in an imaging facility that utilizes a standardized lung nodule identification, classification, and reporting system.

Question 6: What is the most commonly used structured reporting system for low-dose CT lung cancer screening?

The American College of Radiology provides a structured reporting system called Lung-RADS, most recently updated in November 2022, as shown in Figure 3. (ACR Lung-RADS v2022). This system allows standardization of how screening LDCT scans are interpreted and reported and provides clear recommendations for follow-up and management.

Figure 3. American College of Radiology Lung-RADS v2022 Standardized Lung Cancer Screening CT Reporting and Management Recommendations

American College of Radiology™

Lung-RADS® v2022

Release Date: November 2022

Lung-RADS	Category Descriptor	Findings	Management
0	**Incomplete** Estimated Population Prevalence: ~ 1%	Prior chest CT examination being located for comparison (see note 9)	Comparison to prior chest CT;
		Part or all oflungs cannot be evaluated	Additional lung cancer screening CT imaging needed;
		Findings suggestive of an inflammatory or infectious process (see note 10)	1-3 month LDCT
1	**Negative** Estimated Population Prevalence: 39%	**No lung nodules OR**	12-month screening LDCT
		Nodule with benign features: • Complete, central, popcorn, or concentric ring calcifications **OR** • Fat-containing	
2	**Benign** - Based on imaging features or indolent behavior Estimated Population Prevalence: 45%	**Juxtapleural nodule:** • < 10 mm (524 mm^3) mean diameter at baseline or new **AND** • Solid; smooth margins; and oval, lentiform, or triangular shape	
		Solid nodule: • < 6 mm (< 113 mm^3) at baseline **OR** • New < 4 mm (< 34 mm^3)	
		Part solid nodule: • < 6 mm total mean diameter (< 113 mm^3) at baseline	
		Non solid nodule (GGN): • < 30 mm (< 14,137 mm^3) at baseline, new, or growing **OR** • ≥ 30 mm (≥ 14,137 mm^3) stable or slowly growing (see note 7)	
		Airway nodule, subsegmental - at baseline, new, or stable (see note 11)	
		Category 3 lesion that is stable or decreased in size at 6-month follow-up CT **OR** Category 4B lesion proven to be benign in etiology following appropriate diagnostic workup	
3	**Probably Benign** - Based on imaging features or behavior Estimated Population Prevalence: 9%	**Solid nodule:** • ≥ 6 to < 8 mm (≥ 113 to < 268 mm^3) at baseline **OR** • New 4 mm to < 6 mm (34 to < 113 mm^3)	6-month LDCT
		Part solid nodule: • ≥ 6 mm total mean diameter (≥ 113 mm^3) with solid component < 6 mm (< 113 mm^3) at baseline **OR** • New < 6 mm total mean diameter (< 113 mm^3)	
		Non solid nodule (GGN): • ≥ 30 mm (≥ 14,137 mm^3) at baseline or new	
		Atypical pulmonary cyst: (see note 12) • Growing cystic component (mean diameter) of a thick-walled cyst	
		Category 4A lesion that is stable or decreased in size at 3-month follow-up CT (excluding airway nodules)	
4A	**Suspicious** Estimated Population Prevalence: 4%	**Solid nodule:** • ≥ 8 to < 15 mm (≥ 268 to < 1,767 mm^3) at baseline **OR** • Growing < 8 mm (< 268 mm^3) **OR** • New 6 to < 8 mm (113 to < 268 mm^3)	3-month LDCT; PET/CT may be considered if there is a ≥ 8 mm (≥ 268 mm^3) solid nodule or solid component
		Part solid nodule: • ≥ 6 mm total mean diameter (≥ 113 mm^3) with solid component ≥ 6 mm to < 8 mm (≥ 113 to < 268 mm^3) at baseline **OR** • New or growing < 4 mm (< 34 mm^3) solid component	
		Airway nodule, segmental or more proximal - at baseline (see note 11)	
		Atypical pulmonary cyst: (see note 12) • Thick-walled cyst **OR** • Multilocular cyst at baseline **OR** • Thin- or thick-walled cyst that becomes multilocular	
4B	**Very Suspicious** Estimated Population Prevalence: 2%	**Airway nodule,** segmental or more proximal - stable or growing (see note 11)	Referral for further clinical evaluation
		Solid nodule: • ≥ 15 mm (≥ 1767 mm^3) at baseline **OR** • New or growing ≥ 8 mm (≥ 268 mm^3)	Diagnostic chest CT with or without contrast; PET/CT may be considered if there is a ≥ 8 mm (≥ 268 mm^3) solid nodule or solid component; tissue sampling; and/or referral for further clinical evaluation Management depends on clinical evaluation, patient preference, and the probability of malignancy (see note 13)
		Part solid nodule: • Solid component ≥ 8 mm (≥ 268 mm^3) at baseline **OR** • New or growing ≥ 4 mm (≥ 34 mm^3) solid component	
		Atypical pulmonary cyst: (see note 12) • Thick-walled cyst with growing wall thickness/nodularity **OR** • Growing multilocular cyst (mean diameter) **OR** • Multilocular cyst with increased loculation or new/increased opacity (nodular, ground glass, or consolidation)	
		Slow growing solid or part solid nodule that demonstrates growth over multiple screening exams (see note 8)	
4X	Estimated Population Prevalence: < 1%	Category 3 or 4 nodules with additional features or imaging findings that increase suspicion for lung cancer (see note 14)	
S	**Significant or Potentially Significant** Estimated Population Prevalence: 10%	**Modifier:** May add to category 0-4 for clinically significant or potentially clinically significant findings unrelated to lung cancer (see note 15)	As appropriate to the specific finding

Taken from: Lung-RADS v2022. American College of Radiology (ACR). 2022. https://www.acr.org/Clinical-Resources/Clinical-Tools-and-Reference/Reporting-and-Data-Systems/Lung-RADS

Question 7: Ms. Jones' initial LDCT was considered Lung-RADS 1. She undergoes several additional screening CTs through the years, all of which are "negative". At what point would you discontinue LCS?

Based on the latest (2021) USPSTF guidelines, screening should be discontinued once a person has not smoked for 15 years, reaches 80 years of age, or develops a health problem or change in functional status that substantially limits life expectancy or the ability or willingness to have curative-intent therapy.

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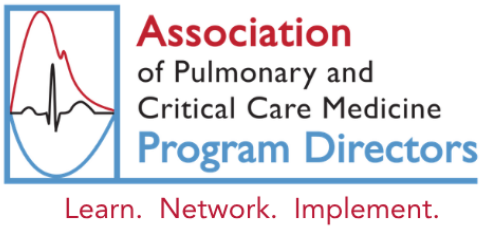

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