Perspective

Delivering tobacco dependence treatment in lung cancer screening programs serving socioeconomically disadvantaged populations

Hasmeena Kathuria

Pulmonary Center, Department of Medicine, Boston University School of Medicine, Boston, MA, USA

Correspondence to: Hasmeena Kathuria, MD. Pulmonary Center, Department of Medicine, Boston University Medical Center, 72 East Concord Street, R304, Boston, MA, USA. Email: hasmeena@bu.edu.

Abstract: Smokers with low socioeconomic status (SES) are at a higher risk for developing and dying from lung cancer due to limited access to health care services and higher smoking prevalence. In 2011, the National Lung Screening Trial (NLST) found that in patients at high risk for developing lung cancer, lung cancer screening with low-dose helical computed tomography (LDCT) resulted in a 20% reduction in mortality from lung cancer. Current smokers who undergo annual LDCT screening and quit smoking derive the greatest reduction in lung cancer mortality. Thus, providing both LDCT screening and tobacco dependence treatment to current smokers can dramatically reduce smoking-related morbidity and mortality. In this report, we summarize the Society for Research on Nicotine and Tobacco (SRNT) and the Association for the Treatment of Tobacco Use and Dependence (ATTUD) guidelines on integrating smoking cessation interventions into lung cancer screening programs. We discuss barriers, potential solutions, and ongoing research efforts on how to implement tobacco treatment within LDCT screening, particularly as it pertains to low SES populations.

Keywords: LDCT screening; smoking cessation; lung cancer screening; health disparities; tobacco dependence treatment

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Background

Lung cancer continues to be the leading cause of cancer death in the United States with cigarette smoking accounting for 85–90% of all lung cancer cases in the United States (1,2). While the prevalence of smoking has declined since the 1960s, tobacco use is alarmingly high in low-income populations (3). Underserved patients with low socioeconomic status (SES) are at a higher risk for developing and dying from lung cancer due to limited access to health care services and higher smoking prevalence (3-5).

Although quitting smoking is the most effective intervention to reduce lung cancer mortality (6,7), quit rates are low. Certain groups, including smokers with lower incomes, individuals with co-morbid substance use and/or psychiatric disorders, and certain minority groups have higher rates of tobacco use and are less likely to be offered, to use, and to successfully complete evidence-based tobacco dependence treatment (8-11). Therefore, connecting underserved smokers with evidence-based cessation treatment is critical for reducing tobacco related cancer disparities.

Lung cancer screening is one such opportunity to connect low SES smokers to tobacco treatment. In 2011, the National Lung Screening Trial (NLST) found that in patients at high risk for developing lung cancer, lung cancer screening with low-dose helical computed tomography (LDCT) resulted in a 20% reduction in mortality from lung cancer compared to screening with single-view chest X-ray (12). The U.S. Preventive Services Task Force (USPSTF) recommends that for those at high risk for lung

cancer (those aged 55–80 years with a 30-pack-year smoking history who were either current smokers or had quit within the last 15 years) undergo annual screening for lung cancer with LDCT (13).

Approximately 50% of individuals eligible for LDCT screening are estimated to be current smokers (14,15). Within the NLST, current smokers, blacks, and those with less than a high school education had a higher risk of lung cancer death (16). Current smokers who undergo annual LDCT screening and successfully quit smoking derive the greatest reduction in lung cancer mortality. Thus, providing both LDCT screening and tobacco dependence treatment to current smokers offers the opportunity to dramatically reduce smoking-related morbidity and mortality.

Recognizing the importance associated with helping adults quit smoking, the USPSTF recommends that smoking cessation interventions be delivered in conjunction with LDCT screening (17). Additionally, the Centers for Medicare and Medicaid Services (CMS) requires current smokers to receive counseling on the importance of smoking cessation and, if appropriate, information about smoking-cessation interventions in order to receive Medicare reimbursement of LDCT screening. Lung cancer screening programs thus offer a unique opportunity to incorporate tobacco treatment.

The Society for Research on Nicotine and Tobacco (SRNT) and the Association for the Treatment of Tobacco Use and Dependence (ATTUD) have recently provided a clinical guideline regarding delivery of smoking cessation interventions in the context of lung cancer screening (18). In this report, we summarize the SRNT/ATTUD guidelines on integrating smoking cessation interventions into lung cancer screening programs. We discuss barriers, potential solutions, and ongoing research efforts on how to implement tobacco treatment within lung cancer screening programs, particularly as it pertains to low SES populations.

Summary of SRNT/ATTUD Clinical Guideline on delivery of smoking cessation interventions within lung cancer screening programs

The SRNT/ATTUD has recently published a position statement on pairing smoking-cessation statements with lung cancer screening (18). The guideline recommends that smokers who present for lung cancer screening should be encouraged to quit smoking at each visit, regardless of lung cancer screening results. Smokers in this high risk group should be assisted with access to evidence-based behavioral and pharmacologic treatments as outlined in the US Public Health Service (PHS) *Treating Tobacco Use and Dependence Clinical Practice Guideline* and that follow-up contacts to support smoking-cessation efforts should be arranged for smokers (19).

The PHS outlines an effective, brief intervention model called the 5As. In this model, at each visit, health care providers should "Ask" patients about their smoking, "Advise" smokers to quit, "Assess" smokers' willingness to quit, "Assist" smokers in quitting, (such as provide practical counseling and FDA approved medications), and "Arrange" for follow-up with smokers (by telephone or in person) after their scheduled quit date. In a retrospective case-control study analyzing self-reported physician interventions and quit rates by NLST participants, among the 5As approach, the "Assist" and "Arrange" steps increased odds of quitting by 40% and 46% respectively (20).

The SRNT/ATTUD position statement on pairing smoking cessation services with LDCT screening highlights that because motivation to quit fluctuates in this population, that an opt-out tobacco-treatment approach should be considered in which all smokers undergoing LDCT screening receive access to smoking-cessation treatment regardless of their motivation to quit (18). The SRNT/ATTUD position statement also recommends that for patients who are not motivated to quit, evidence-based strategies, such as the 5Rs should be used at each visit to motivate smokers to try quitting smoking. In the 5R model, at each visit health care providers should have discussions with the patient of the personal "Relevance" of smoking cessation, the "Risks" of smoking, the "Rewards" of smoking cessation, and the potential "Roadblocks" to quitting. The fifth step is to "Repeat" these steps as necessary at all visits.

Barriers and potential solutions to delivering guideline-recommended tobacco treatment in low SES smokers undergoing LDCT screening

Most U.S. adult smokers are poor, have less than a high school education, and/or are on Medicaid (21). In implementing tobacco treatment in lung cancer programs that serve predominately low SES smokers, it is important to understand both patient-level and provider-level factors that contribute to disparities in use of tobacco cessation treatment in this patient population. Low income smokers may be less likely to seek treatment because of significant

life stressors, lower levels of knowledge about the benefits of pharmacotherapy, as well as significant barriers to health care access (22,23). Clinicians should therefore not miss opportunities to address smoking cessation at any screening visit. Unfortunately, while most health care providers believe smoking cessation is important, many studies have noted that only a small minority provide guideline recommended cessation support to their patients (22,23). Within the LDCT screening setting, barriers such as limited time, resources, and knowledge about tobacco treatment, as well as difficulty identifying screen-eligible smokers prevent optimal delivery of tobacco treatment. Overcoming these barriers in any given facility will vary depending on the resources available for tobacco dependence treatment.

Electronic health record (EHR) to identify and treat screen-eligible smokers

Using the EHR to proactively reach screen-eligible patients may be effective at overcoming provider bias in offering LCS and/or smoking interventions to a variety of patient populations, including racial and ethnic minorities, low income patients, or patients with mental health disorders. The EHR can also prompt clinicians to encourage quitting and connect patients to cessation resources and materials such as quitlines. Interactive Voice Response (IVR), a phone technology that allows a computer to detect voice responses during a call, may provide an efficient way to reach large populations, such as patients identified in the EHR as screen-eligible smokers.

Knowledge of FDA-approved medications and counseling skills

It is imperative that clinicians have the knowledge and skills to deliver smoking cessation services to their patients during the LDCT screening visit. There is high quality evidence that delivered smoking cessation counselling (either group or individual) can assist smokers to quitting and that intensive counseling improves quit rates over brief interventions (19). Interventions that combine pharmacotherapy and behavioral support increase smoking cessation success compared to a minimal intervention or usual care. Smokers should be offered counseling, such as the 5A's model, at each screening visit.

There are seven FDA-approved medications for tobacco treatment: (I) five forms of nicotine replacement therapy (nicotine gum, lozenges, and patches can be bought without a prescription; nicotine nasal spray and inhalers are available by prescription only); (II) Bupropion (Wellbutrin; Zyban); and (III) Varenicline (Chantix). Physicians should feel comfortable in prescribing combination NRT (e.g., patch plus gum) and combination NRT plus bupropion to further improve quit rates. Clinicians should also know that based on the results of a large clinical trial (24), the Boxed Warning for serious mental health side effects from the Chantix and Bupropion drug label was removed in December 2016. Prescribing guidelines for the 7 FDA-approved medications are available at http://www.aafp.org/dam/AAFP/documents/patient_care/tobacco/pharmacologic-guide.pdf.

Available resources and information for receiving training in tobacco treatment

For some facilities, a dedicated service in the LDCT facility or a dedicated clinician with tobacco treatment experience could be integrated into the lung cancer screening treatment team to provide tobacco treatment services. Training in tobacco treatment can be received either online (http://tobaccodependence.chestnet.org/) or by attending specialized training in tobacco treatment (http://www.attud.org). Furthermore, materials tailored to Hispanic and African-American patients are available at http://smokefree.gov. Other approaches include referring to internal or external facilities specializing in tobacco treatment and/or toll-free quitlines (800-QUIT-NOW) available in all 50 states. Quit Lines (available in both English and Spanish) may be particularly helpful for low-income patients since access to these services is free.

Tailoring smoking cessation counseling based on smokers' responses to LDCT screening and results

Some evidence exists that smokers receiving positive LDCT screening results may have increased smoking cessation (25-28), whereas those receiving normal screening results may feel little urgency to quit (29). Clinicians can co-create a teachable moment that builds on these responses to screening and LDCT results to motivate their patients to quit smoking. A tobacco treatment specialist integrated into the LDCT process can deliver tailored interventions based on the individual's readiness to quit and/or lung cancer screening results to help overcome clinician barriers of time constraints, competing priorities, and knowledge gap of available treatments.

Research gaps and future directions

LDCT screening may represent a "teachable moment" in which to reach these heavily addicted smokers at a time when they may be more aware of the harms of tobacco use and thus more likely to be receptive to smoking cessation interventions. While there are little data on the effectiveness of smoking cessation interventions in the lung cancer screening setting (20,30-35), more intensive interventions appear to be associated with greater improvement in readiness to quit and 6-month smoking abstinence in patients undergoing LDCT screening (20).

In the SRNT/ATTUD guideline, the authors highlight the need for (I) research on the optimal intensity, timing relative to screening, and delivery mode of smoking-cessation interventions for this population and important moderators of these effects and (II) research on the potential adverse effects of screening on smoking-cessation motivation, the barriers to implementing smoking-cessation interventions within LDCT clinics, and the education and training needs of LCDT clinical staff to support smoking cessation (18). The American Thoracic Society (ATS) has recently convened a panel to develop a policy statement outlining a research agenda on the integration and implementation of smoking cessation interventions with LDCT lung cancer screening (36). This statement highlights research gaps and prioritizes key research questions in three domains: (I) target population to study; (II) adaptation, development, and testing of interventions; and (III) implementation of interventions with demonstrated efficacy and identified standardized measures to conduct this research.

To address research gaps in this area, eight clinical trials [seven funded by the National Cancer Institute (NCI) and one by the Veterans Health Administration (VHA)] will test smoking cessation interventions for smokers undergoing LDCT lung cancer screening (37,38). Investigators from these trials have formed the Smoking Cessation within the Context of Lung Cancer Screening (SCALE) collaboration and have outlined standardized measures and approaches to conduct high-quality studies in this setting. Little research has focused on challenges specific to low SES populations, such as how to reach and support low income and minority screen-eligible smokers in their cessation attempts and treatment adherence. Through the American Lung Association (ALA) Lung Cancer Discovery award mechanism, we will be conducting a clinical trial testing whether delivering an inpatient shared decision making and tobacco treatment intervention in a large safety net hospital can promote engagement with LDCT screening and tobacco treatment among low income and minority smokers.

While we await the results of these trials, clinicians can improve the rate of smoking cessation among their current smokers undergoing lung cancer screening by improving their counseling skills (5As), familiarizing themselves with tobacco clinical guidelines, incorporating reminders into practice systems, and increasing their knowledge of pharmacotherapy. As outlined in the PHS and SRNT/ATTUD guidelines, all smokers should be offered counseling and pharmacological treatment at each screening visit and when feasible be offered the most intensive intervention available, regardless of lung cancer screening results and motivation to quit.

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Footnote

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