**Background:** Lung cancer is the most preventable leading cause of cancer death in the United States. Smoking while receiving treatment for lung cancer can decrease the effectiveness of the treatment and may reduce quality of life. Although many smoking cessation proposals have focused on how to deliver various interventions, they have neglected the issue of how to sustain the interventions and integrate them into practice.

**Objectives:** The purpose of this article is to provide an effective way of educating healthcare professionals (HCPs) on smoking cessation interventions that meet the U.S. Department of Health and Human Services’ 2008 evidence-based clinical practice guidelines.

**Methods:** This article reviews strategies to integrate evidence from research on smoking cessation into practice in sustainable ways that target patients with lung cancer who smoke.

**Findings:** HCPs need evidence-based smoking cessation guidelines, along with interventions that will be effective with their specific smoking population. In addition, HCPs need to incorporate clinical practice guidelines for smoking cessation into their care of patients in ways that can be sustained and evaluated.

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**Impact of Smoking on Lung Cancer**

People who continue to smoke after a lung cancer diagnosis may have exacerbated side effects from treatment (Raleigh, 2010), decreased effectiveness of their treatment, and increased likelihood of secondary cancers or recurrence of cancer at the primary site (Warren et al., 2013b; Weaver et al., 2012). In addition, they may have reduced quality of life that can also affect their caregivers (Fujinami, Otis-Green, Klein, Sidhu, & Ferrell, 2012; Warren et al., 2013a). Mounting evidence shows that, compared to patients who are prior smokers or who recently quit, those who continue to smoke after a diagnosis of lung cancer can increase their overall

lung cancer is the leading cause of cancer death in the United States (Centers for Disease Control and Prevention [CDC], 2016), with 224,390 new cases and 158,080 deaths expected in 2016 (American Cancer Society [ACS], 2016). Two objectives put forth in the Healthy People 2020 initiative that are significant to lung cancer are reducing the lung cancer death rate to 45.5% and increasing the number of cancer survivors living five years or longer to 71.7% (U.S. Department of Health and Human Services [USDHHS], 2014b). The overall five-year survival rate of lung cancer is 17%, which is considerably less than the 69% overall survival rate for cancer (ACS, 2016).

The primary cause of lung cancer is smoking (Jemal et al., 2008). Globally, use of tobacco products leads to 1.6 million of the total 7.4 million deaths from cancer each year (World Health Organization, n.d.). Another Healthy People 2020 goal, which was retained from the 2010 goals, is the reduction of the number of adults 18 years and older who smoke to 12%. The National Health Interview Survey revealed the 2014 smoking prevalence among adults in the U.S. to be about 17%; however, it remains high among those with low educational attainment (43%) and low income (26%) (Jamal et al., 2015). The yearly cost of smoking from 2009–2012 exceeded $200 billion because of decreased workplace productivity and costs of treatment for smoking-related illness (USDHHS, 2014a).
mortality (Gajdos et al., 2012; Warren, Kasza, Reid, Cummings, & Marshall, 2013) and decrease their overall survival time (Pirker et al., 2012). Although the focus of this article is patients with lung cancer, smoking cessation is a beneficial intervention for any patient with cancer who smokes (Warren, Sobus, & Gritz, 2014).

For every dollar spent on interventions to treat tobacco dependence, a $2–$3 return stems from that investment, making tobacco cessation a highly cost-effective intervention (Richard, West, & Ku, 2012). These cost savings are important considering that healthcare costs in 2013 for cancer were $74.8 billion (ACS, 2016), and the median cost per person for adjuvant therapy was more than $17,000 per month (Buck, Saverno, Miller, Arondekar, & Walker, 2015). The purpose of this article is to recommend (a) a free curriculum for healthcare professionals (HCPs), including doctors, nurses, pharmacists, and clinical social workers, with evidence-based smoking cessation techniques and treatments; (b) approaches for incorporating smoking cessation treatment into practice in sustainable ways; and (c) methods to tailor smoking cessation treatments to patients with lung cancer.

Healthcare Professionals and Smoking Cessation

Little information is available on the prevalence of smoking among those diagnosed with lung cancer, but the overall number of patients with cancer who continue to smoke after diagnosis has been estimated to be as high as 50% (Morgan et al., 2011). Although not all patients who are diagnosed with lung cancer are current smokers, some patients may be recent quitters who could be at risk for relapse because of depression and fear of cancer recurrence (Simmons et al., 2013). This is attributable, in part, to the psychological stress of the lung cancer diagnosis and treatment (Gonzalez & Jacobsen, 2012). Factors associated with successful abstinence by patients with lung cancer who smoke are higher self-efficacy and lower levels of cravings, depression, and anxiety (Cooley et al., 2012). Gonzalez and Jacobsen (2012) found that 36% of patients with lung cancer had scores of 16 or greater on the Center for Epidemiologic Studies Depression scale, indicating clinically significant depression levels; those with a history of major depressive disorder had the highest levels of depression among study participants.

One of the best ways HCPs can be of service to patients with lung cancer who smoke is to know the clinical practice guidelines for tobacco cessation and dependence and to have well-organized and sustainable ways to implement them into practice. In addition, HCPs need to be able to tailor their smoking cessation interventions to the patient populations they serve. Unfortunately, several studies of HCPs discovered the opposite: The guidelines are not known, and, if they are, they are implemented only sporadically. In a study by Warren et al. (2013b) 1,197 oncologists who treated patients with different cancer disease sites, including those with lung cancer, reported that more than 80% believed smoking affects the effectiveness of cancer treatment, but that less than 40% provided cessation support. Another study of oncology providers (N = 74) revealed that less than 30% provided cessation support (Weaver et al., 2012).

The major barriers to tobacco cessation interventions reported by oncologists in the Warren et al. (2013b) study were lack of knowledge and skills to provide cessation support and resistance of patients to quitting. Similarly, of the 1,507 respondents from medical and radiation oncology, pulmonary medicine, surgery, and other areas who had a medical degree (n = 1,306), nursing degree (n = 37), or science degree (n = 103) to a survey from the International Association for the Study of Lung Cancer, 561 strongly agreed and 636 agreed that tobacco use influences treatment results in patients with cancer; in addition, 603 strongly agreed and 575 agreed that tobacco cessation should be consistently incorporated into cancer care (Warren et al., 2013a). However, only one-third of respondents felt skilled enough to offer smoking cessation support, and more than half doubted their ability to do so. In both studies, follow-up support at.

Ask
• Ask the patient if he or she or someone he or she lives with smokes or uses tobacco.
• Provide the reason for asking; note that this question is asked of all patients because it can negatively affect cancer treatment.
• Asking about tobacco use can be done at any of the five stages of behavior change (precontemplation, contemplation, preparation, action, maintenance).

Advise
• Advise the patient to quit with an explanation of smoking’s specific impact on health and treatment (e.g., decreases ability to heal, can make treatment less effective).
• May be less effective for those in precontemplation

Assess
• Assess the patient’s readiness to quit.
• If the patient is ready to quit, move on to the next step (assist). If the patient is not ready to quit, help him or her to think about quitting.
• Screen for depression, level of nicotine dependence, and prior quit attempts.

Assist
• Assist the patient in developing a plan for quitting.
• Note the benefits of quitting, assess last quit attempt (what worked, what did not work), talk about patient support, assist the patient to set a quit date (e.g., three weeks), discuss pharmacotherapy (if not contraindicated), and prepare the patient for barriers to quitting (e.g., cravings, withdrawal, stress, triggers).
• Extend quit assistance to tobacco users who live with the patient to decrease barriers to quitting.
• Preparation phase

Arrange
• Arrange follow-up care for the patient, and assess progress of the quit attempt (effectiveness of support structures and pharmacotherapy, relapse occurrence).
• The healthcare professional should make at least one follow-up telephone call with the patient.
• Refer to the patient to telephonic quitline service, website service, face-to-face or group counseling, or coaching with a person trained in health counseling or coaching, depending on resources and patient preference.

FIGURE 1. The Five A’s of Tobacco Cessation
Note. Based on information from Fiore et al., 2008; Prochaska & Velicer, 1997.
Evidence-Based Clinical Practice Guidelines

The USDHHS has proposed comprehensive clinical practice guidelines for treating tobacco use and dependence (Fiore et al., 2008). Among the recommendations are HCPs identifying and documenting tobacco consumption status and performing interventions for those who use tobacco with the five A’s of tobacco cessation (ask, advise, assess, assist, arrange) (see Figure 1); all HCPs should have training in effective tobacco cessation treatments. For patients who are ready to quit smoking, HCPs should encourage the use of counseling and pharmacologic treatments—both of which should be included in tobacco cessation interventions—per the USDHHS guidelines (Fiore et al., 2008). For those who are not ready to make a quit attempt, motivational interventions—the five R’s of tobacco cessation (relevance, risks, rewards, roadblocks, repetition) (see Figure 2)—should be used. Telephone counseling is applicable and available to many different cultural and sociodemographic groups, and it should be promoted to patients as part of their tobacco cessation treatment.

The USDHHS guidelines also proposed comprehensive evidence-based techniques and treatments that provide patients with the best chance of a lasting quit attempt (Fiore et al., 2008). In addition, the interventions geared toward HCPs are brief because HCPs do not have to absorb the entire responsibility of follow-up treatment (for example, they can refer the patient to a telephonic quitline or other counseling service). The guidelines are also specific enough to be readily incorporated into practice, and principles of motivational interviewing (MI), a communication technique that assists the patient in discovering his or her own reason for change (Miller & Rollnick, 2009), are built into brief interventions (Fiore et al., 2008).

Clinical Practice Guidelines Curriculum

An existing curriculum that incorporates the USDHHS guidelines (Fiore et al., 2008) and also addresses the health promotion needs of patients with lung cancer is the Rx for Change curriculum developed by the University of California, San Francisco, Schools of Pharmacy and Medicine (Regents of the University of California, n.d.). This curriculum is free and designed for use by all HCPs. The content includes the epidemiology of tobacco use, principles of addiction, case scenarios for role playing, the five A’s, and the five R’s. In addition, handouts were created for HCPs to help guide patients in employing coping strategies, planning a quit attempt, and addressing withdrawal symptoms. If needed, the reading level of these handouts can be reduced by decreasing the use of complex medical terminology and decreasing sentence length (U.S. National Library of Medicine, 2016), as well as changing multisyllabic words to words with fewer syllables. The reading level of a document can be calculated using the Flesch-Kincaid grade level formula (Flesch, 1948).

The Rx for Change curriculum was created with contributions from scholars in the fields of tobacco prevention, tobacco cessation, pharmacy, and medicine (Kelley, Heath, & Crowell, 2006). A review of studies that have used the Rx for Change curriculum supports its use for a variety of disciplines. Cardiology fellows had increased knowledge and confidence, as well as fewer perceived barriers, and they were more likely to assist patients with quitting after receiving the training (Prochaska, Benowitz, Glantz, Hudmon, & Grossman, 2011). Pharmacists who had completed the curriculum and used it saw a 25% quit rate among participants who smoked (Khan et al., 2012). In addition, advanced practice nursing faculty who learned the curriculum perceived their effectiveness of teaching content on health effects and the five A’s to be significantly higher at a 12-month follow-up survey (Heath et al., 2007). Overall, perceived ability in assisting patients to quit improved significantly among a mixed group of 205 HCPs, of which 36% were nurses (Chen et al., 2015), and perceived confidence to perform tobacco cessation interventions improved greatly among 119 Bachelor of Science in Nursing students (Schwindt, McNelis, & Sharp, 2014).

The Rx for Change curriculum features presentation slides, videos, and case scenarios for role-playing that HCPs can use in a class setting where the instructor can evaluate the application of the content. Also included is content on behavioral, affective, and pharmacologic interventions for patients. The theoretical framework of the curriculum is based on the transtheoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992), which consists of five phases: (a) precontemplation (not planning to quit in the next six months), (b) contemplation (planning to quit in the next six months), (c) preparation (planning to quit very soon), (d) action (person has stopped smoking), and (e) maintenance (person is trying to prevent relapse) (Prochaska & Velicer, 1997). This model is particularly important for smoking cessation because it was developed for addictive behaviors and accounts for the potential for relapse. When teaching about

Relevance
- Ask the patient about why smoking cessation is important to himself or herself (e.g., health, exposure to family).

Risks
- Ask the patient about the potential risks of smoking in the present and in the future.

Rewards
- Ask the patient about the benefits of stopping smoking (e.g., feeling better).

Roadblocks
- Ask the patient about what may keep him or her from stopping smoking (e.g., withdrawal, enjoyment of smoking).

Repetition
- Use the five R’s when patients have low motivation. Remind the patient that relapse is common and sometimes occurs several times before a lasting smoking cessation.

Note: If the patient is not ready to quit (precontemplation phase of behavior change), healthcare professionals should use the five R’s, which are based on principles of motivational interviewing.

FIGURE 2. The Five R’s of Tobacco Cessation

Note. Based on information from Fiore et al., 2008.
the clinical practice guidelines, the following points should be emphasized:

- The HCP needs to use the five A’s or the five R’s in a non-judgmental way.
- The diagnosis of lung cancer can be a teachable moment (Gritz et al., 2006).
- Two key aspects of MI are (a) expressing empathy by using open-ended questions to explore what smoking cessation means to the patient and (b) rolling with resistance in which the HCP learns to yield when the patient is resistant (Fiore et al., 2008).

Sustainability of the Intervention

The sustainability of a comprehensive tobacco cessation program by HCPs in the oncology setting will largely depend on the dedication of the people involved and the culture of the healthcare setting (Scheirer, 2013). Champions should promote the practice change (Schön, 1963) and maintain enthusiasm (Maidique, 1980) for planning, implementation, and evaluation of the project. Flyers, huddles, and small presentations at staff meetings can advertise the classes where staff will learn the practice guidelines.

Pretests can be given to HCP attendees before class, whereas post-tests can be given immediately after class and at other follow-up time points as useful ways to assess and evaluate learning (Albrecht, Kelly-Thomas, Osborne, & Ogbagaber, 2011). However, learning does not end in the classroom; to maintain fidelity of the intervention, periodic face-to-face assessments of staff performance when using the five A’s or the five R’s with patients will need to occur (Shershnaya, Cohen, Larrison, Detzler, & Ales, 2014). Staff can also be periodically surveyed to determine problems and successes after the implementation process (Katz et al., 2012).

Documentation of use of the practice guidelines will also be key to sustainability of the cessation interventions and evaluation of successful change. Accurate and consistent documentation of the five A’s and the five R’s will assist HCPs with determining what phase of the behavior change process the patient is in, so they can plan for the next phase. If documentation is done in an electronic health record (EHR), then other HCPs in the system will also know the patient’s progress toward quitting and his or her history of use and quit attempts. After the change has been implemented, champions and other HCPs will need to audit documentation and follow up with errors (Kunyk, Els, Papadakis, & Selby, 2014) or glitches in the documentation system. This may involve one-on-one coaching or written feedback about errors with HCPs (Kunyk et al., 2014) or meetings with the information technology department to make corrections in the EHR.

Critical aspects of sustaining a practice change in a healthcare organization are (a) having support from organization leadership (Scheirer, 2013), (b) employing partnerships with state-level telephonic quitline programs to facilitate the referral process, (c) setting attainable goals (Irwin, Bergman, & Richards, 2013), (d) providing periodic feedback to staff on the progress of outcomes and goals (Irwin et al., 2013; Scheirer, 2013), (e) celebrating successes, (f) performing drill downs, or looking at problems with a detailed approach, (g) recognizing specific staff accomplishments, and (h) disseminating stories of patient successes in quitting.

Tailoring the Intervention

The third phase of the tobacco cessation intervention guided by the five A’s involves a comprehensive assessment by the HCP of the patient’s tobacco use history, recent changes in use, number of quit attempts, level of self-efficacy, barriers to quitting, tobacco use triggers, and level of nicotine dependence. In addition, the HCP can screen for risk of relapse by looking at the patient’s history of depression and screening for new onset of depression. This assessment allows the HCP to then tailor counseling and pharmacology treatment to an individual patient. Medication recommendations for patients who smoke and have a history of depression and for patients with lung cancer are detailed in the USDHHS guidelines (Fiore et al., 2008) and in the American College of Chest Physicians’ clinical practice guidelines for treatment of tobacco use in lung cancer, respectively (Leone, Evers-Casey, Toll, & Vachani, 2013).

Key barriers to tobacco cessation in patients with cancer are having a spouse, significant other, family member, or friend in the same household who uses tobacco, has low levels of self-efficacy, and has high levels of depression (Simmons et al., 2013). One useful way to tailor the 5 A’s approach to tobacco cessation in patients with lung cancer is to extend this counseling to the person with whom the patient lives who also uses tobacco. Individuals who provide support, such as family members who do not use tobacco, can also play a beneficial role in the patient’s quitting process, particularly if they can track triggers, barriers, and effective coping strategies. In addition, they can learn ways to effectively communicate with the patient by avoiding blaming attitudes if relapse occurs. All patients and their family members who smoke should be counseled that exposure to secondhand smoke has an immediate negative impact on the cardiovascular system (USDHHS, 2006) and that consistent exposure to secondhand smoke is a significant obstacle to smoking cessation (Eng et al., 2014, 2015; Kashigar et al., 2013).

Implications for Practice

Healthcare organizations that have adopted the evidence-based tobacco cessation guidelines have experienced some success (Albrecht et al., 2011; Katz et al., 2012). Albrecht et
al. (2011) observed that nursing staff and nurse practitioners from outpatient clinics who learned and implemented the practice guidelines saw a quit rate of about 22% among pregnant women and were able to see patients advance through the stages of change. In an emergency department setting, teaching nurses the guidelines increased the use of all five A’s, except for “advise,” and nurses reported an increase in their ability to deliver smoking cessation counseling (Katz et al., 2012). Although the evidence is limited, these studies show that simply educating staff about the guidelines increases their use of them and their confidence in their ability to help patients stop smoking.

Conclusion

Although guidelines on treating tobacco use and dependence have been available for more than a decade, little progress has been made by HCPs toward adopting them. Providing training to HCPs who care for patients with lung cancer using a comprehensive tobacco cessation curriculum that contains evidence-based guidelines is a significant step toward reducing the mortality, health disparities, and cost of treatment for patients with lung cancer. Patients with lung cancer who smoke will have difficulty changing their behavior without a sustainable smoking cessation program in the oncology setting where they seek care.

References


