Published in final edited form as:

Semin Oncol Nurs. 2008 February ; 24(1): 16–26.

Smoking Cessation and Lung Cancer: Oncology Nurses Can Make a Difference

Mary E. Cooley, PhD, APRN, BC,

Nurse Scientist, Phyllis F. Cantor Center, Research in Nursing and Patient Care Services, Dana-Farber Cancer Institute, Boston, MA

Rebecca L. Sipples, APRN,

Thoracic Oncology Nurse Practitioner, Yale Comprehensive Cancer Center, Yale University School of Nursing, New Haven, CT

Meagan Murphy, BS, and

Research Intern, Phyllis F. Cantor Center, Research in Nursing and Patient Care Services, Dana-Farber Cancer Institute, Boston, MA

Linda Sarna, RN, DNSc, FAAN

Professor, University of California, Los Angeles, School of Nursing, Los Angeles, CA

Abstract

OBJECTIVES—Provide an overview of the impact of smoking after a diagnosis of lung cancer, discuss the relationship between smoking cessation and improved outcomes during the lung cancer trajectory, present information about tobacco dependence evidence-based treatments, reimbursement for these treatments, and tobacco-related resources available for patients and health care professionals, and emphasize the important role of nurses.

DATA SOURCES—Published articles, reports, websites, and research studies.

CONCLUSION—Tobacco use is associated with 30% of cancer deaths. Prevention of tobacco use and cessation are primary ways to prevent lung cancer. However, even after a diagnosis of lung cancer, smoking cessation is important in improving survival and quality of life. Although effective tobacco dependence treatments are available to help smokers quit smoking, persistent efforts over repeated contacts may be necessary to achieve long-term cessation.

IMPLICATION FOR NURSING PRACTICE—Oncology nursing action is essential in the identification of and intervention with patients who struggle with tobacco dependence after diagnosis.

Keywords

smoking cessation interventions; tobacco dependence treatment and lung cancer

Address reprint request to: Mary E. Cooley PhD, APRN, BC, Phyllis F. Cantor Center, Research in Nursing and Patient Care Services, Dana-Farber Cancer Institute, 44 Binney Street, CP301, Boston, MA 02115, (617) 632-4653, mary_cooley@dfci.harvard.edu.

This work was completed from the Phyllis F. Cantor Center, Research in Nursing and Patient Care Services, Dana Farber Cancer Institute, Boston, MA; Yale Comprehensive Cancer Center and Yale School of Nursing, New Haven, CT; and University of California, Los Angeles, School of Nursing, Los Angeles, CA.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Lung cancer is one of the most common smoking-related malignancies accounting for the second most common cancer, and the leading cause of cancer death in men and women in the United States (US). Lung cancer causes more deaths than the next three most common cancers (breast, colorectal and prostate) combined. An estimated 160,390 deaths will occur from lung cancer during 2007. It is estimated that 90% of lung cancers are related to smoking.¹

Although the link between smoking and lung cancer is well-established, the benefits of smoking cessation after a diagnosis of lung cancer are not as widely recognized. Smoking cessation can improve survival, treatment efficacy, and improve overall quality of life²⁻⁴. Approximately half of all smokers have quit prior to their diagnosis⁵. Despite a diagnosis of cancer, the addictive properties of nicotine can make quitting difficult and the risk for relapse high. This article provides an overview of the impact of continued smoking after a diagnosis of lung cancer and the importance of smoking cessation. The benefits of quitting, and the important role of the oncology nurse in assisting these efforts, will be emphasized along with strategies to incorporate smoking cessation interventions into the clinical setting.

Smoking Prevalence Rates and the Benefits of Cessation

The prevalence of smoking among newly diagnosed lung cancer patients tends to be higher than the general population. Estimates for the prevalence of smoking have ranged from 24% to 60% among newly diagnosed lung cancer patients as compared to 12% to 29% among the general United States population⁵⁻⁷. Although the diagnosis of lung cancer presents a compelling reason to quit smoking, studies have estimated that between 8% to 17% of smokers continue to smoke after the diagnosis^{5,6}. This finding underscores the highly addictive nature of tobacco dependence and the importance of assessing smoking status at diagnosis and incorporating smoking cessation interventions into clinical care.

Smoking cessation has immediate as well as long-term benefits. The immediate benefits of smoking cessation are lower blood pressure, improved oxygen transportation, improvements in smell, taste, circulation and breathing, increased energy, and a heightened immune response⁸. Quitting smoking is associated with improvements in cognitive function, psychological well-being and self-esteem leading to an overall improvement in quality of life⁹. Lung cancer patients who stop smoking experience similar health benefits. For instance, lung cancer patients who stopped smoking reported decreased fatigue, shortness of breath, increased activity level, and improved appetite, sleep, and mood⁴.

The Impact of Smoking on Outcomes of Cancer Treatment Modalities

Smoking can negatively affect outcomes of cancer treatments through direct and indirect effects. Tobacco smoke and its constituents have active biological effects that can interact with cancer treatments. Moreover, the type and severity of smoking-related comorbidities may affect the type of cancer treatments that are chosen. For example, severe lung or cardiovascular disease may limit the option for or extent of lung cancer surgery, use of radiation treatment or type of chemotherapy agent that can be used in treatment. An overview of the impact of smoking on cancer treatment modalities and their outcomes are provided in the following section.

Smoking can adversely affect outcomes for those undergoing lung cancer surgeries, even in the absence of chronic lung disease. Smokers' are at increased risk of experiencing post-operative complications, such as delayed wound healing, and pulmonary and cardiovascular complications, as compared to non-smokers or former smokers¹⁰. However, outcomes may improve with smoking cessation prior to surgery. Controversy exists about the best time to quit smoking^{11,12}. Current evidence suggests that it is safe and important to quit smoking as soon as possible prior to lung cancer surgery¹².

Smoking increases complications of radiation therapy and can adversely affect outcomes. Smoking history was found to be a major risk factor for development of radiation pneumonitis after treatment for lung cancer. Patients who continue to smoke and undergo radiation therapy have a 20% greater probability of experiencing radiation pneumonitis¹³. Also, infection rates were higher among lung cancer patients receiving radiation treatment who had higher pack-years of smoking, which was associated with decreased survival¹⁴.

Continued smoking can have detrimental effects on efficacy of chemotherapy for lung cancer patients. Multiple mechanisms including chemoresistance, chemo-insensitivity and altered chemotherapeutic levels may partially explain this phenomenon. There is evidence that nicotine increases the metabolism of multiple drugs via the induction of hepatic enzymes, potentially decreasing efficacy of certain agents¹⁵. Another mechanism to explain poorer clinical outcomes is that although nicotine is not carcinogenic, it can induce cell proliferation and angiogenesis and suppress apoptosis induced by certain chemotherapeutic agents. A recent study has demonstrated in vivo that nicotine inhibited the apoptotic potential of cisplatin, a common agent used to treat lung cancer¹⁶.

Smokers in smoke-free hospital and hospice settings may experience severe nicotine withdrawal symptoms such as irritability, anxiety, insomnia, depressed mood, and restlessness. In fact, case reports have described delirium and terminal restlessness to be manifestations of nicotine withdrawal¹⁷. Smokers who enter end of life and continue to smoke can pose safety hazards to themselves and others. Continued smoking and changes in mental status can create a risk for starting a fire. Thus, assessment of smoking status is essential throughout the continuum of care so that appropriate tobacco treatment interventions can be initiated.

Smoking Cessation Interventions for Oncology Nursing Care

Understanding Tobacco Dependence

In 1988, the Surgeon General's Report on Nicotine Addiction provided conclusive evidence that tobacco is addicting in the same way as other drugs that are responsible for addiction. In fact, nicotine, the dependence producing substance in tobacco, is similar to heroin and cocaine in its addictive properties¹⁸. This landmark report promoted the fact that tobacco dependence is a chronic condition characterized by periods of abstinence and relapse, thus requiring repeated interventions by clinicians. Tobacco dependence is a complex process that is characterized by physical, psychological, social, and behavioral components, which must all be addressed to enhance success of treatment.

Smoking Cessation Treatments

Oncology nurses are in a unique position to assist their patients to quit smoking during a time when patients are motivated and willing to quit. The Treating Tobacco Dependence Clinical Practice Guideline (*Guideline*) for treating tobacco dependence is available through the US Public Health Service⁸. This version is being revised and a new edition will be available in the future. The current *Guideline* recommends use of the five A's model (ask, advise, assess, assist, and arrange) to guide treatment (Table 1). The five R model (relevance, risks, rewards, roadblocks, repetition) with strategies to enhance motivation for smoker's with difficulty quitting is displayed in Table 2. In addition, tobacco dependence treatment (TDT) is significantly enhanced with the use of pharmacological cessation aides and behavioral counseling. Lung cancer patients who continue smoking after diagnosis are often highly dependent smokers. Thus, the following section provides an overview of TDT with an emphasis on treatment of highly dependent smokers.

Pharmacological Cessation Aides for Tobacco Dependence—The use of pharmacological cessation aides has been found to double long-term smoking cessation rates⁸. First-line TDT includes: nicotine replacement therapies (NRT's), bupropion, and varenicline¹⁹. Combined pharmacological treatment increases abstinence rates and should be considered for patients who have failed previous single modality treatments⁸. Two other medications are recommended by the US Public Health Service as second line TDT: clonidine and nortriptyline⁸. These drugs have evidence for efficacy in TDT but play a limited role due to lack of Federal Drug Administration approval and potential for side effects. These agents may be used if patients do not respond to first line treatments. Because smoking cessation is difficult, especially for highly dependent smokers, relapse back to smoking can be framed as an opportunity to try different medications, higher dosages, or treatment combinations rather than as a treatment failure. The choice of medications is usually selected based on patient preference, insurance coverage, drug cost, and previous experience with cessation aides¹⁹.

Nicotine Replacement Treatments—Five forms of NRT are available in the US; patch, gum, nasal spray, inhaler, and lozenge. Table 3 provides an overview of dosing, prescribing and precautions associated with each form of NRT available in the US. NRT works by partially replacing nicotine levels thereby reducing nicotine withdrawal symptoms. One major problem with the efficacy of NRT's is that they do not deliver nicotine nearly as fast or efficiently as cigarettes. Two other problems undermining efficacy of the patch are underdosing, especially among heavy smokers, and that there is not a way to manipulate nicotine levels during urges^{19,20}. In order to address inadequate replacement with the standard 21 mg patch dose, higher doses of NRT have been tested in clinical trials. A meta-analysis of the efficacy of NRT concluded that there is a small benefit gained from using higher doses of NRT but further studies are needed to reach more definitive conclusions²¹. In order to address the shortcomings of manipulating nicotine levels during urges, there are now multiple forms of short-acting NRT's. One drawback of using short-acting NRT's alone is that they require frequent administration (every 1–2 hours). However, they can be combined with the patch to enhance efficacy. Meta-analysis of combined NRT versus single NRT have shown combined treatment is more effective⁸.

The availability of multiple routes of administration provides an opportunity to combine delivery systems or to individually tailor TDT. Combining the patch with a fast-acting NRT provides a way to titrate nicotine according to a smoker's needs. Comparisons among the various NRT delivery systems have not shown any clear advantages. Therefore, patient preference is an important consideration when choosing the most appropriate agent for an individual. Several studies assessing patient preference for different forms of short acting NRT have identified the inhaler or the spray to be the preferred method of administration, especially among heavier smokers^{20,22}.

The tailored use of NRT within subgroups of smokers may increase efficacy of treatment. Lerman and colleagues found that low to moderate smokers, white and non-obese benefited more from the patch, whereas smokers who were highly dependent, obese or members of an ethnic minority group benefited more from nasal spray²². Pre-testing various short-acting NRT's prior to their use has been suggested as a strategy to enhance adherence and efficacy of the treatment²⁰. Pharmacogenetic approaches to individualizing TDT are underway and appear to be a promising direction for future treatment. Readers are referred to additional sources for this information²³.

Non-nicotine Treatments—Bupropion is an atypical anti-depressant that works by inhibiting the reuptake of dopamine and norepinephrine. Studies have demonstrated that bupropion demonstrated higher quit rates as compared with the patch. Bupropion may be combined with the patch but abstinence rates achieved from combined treatment are not higher

than using bupropion alone⁸. However, a recent study showed that bupropion combined with nasal spray had superior outcomes as compared to either drug alone²⁴. It has also been shown to be more effective in certain subgroups of smokers, such as those who are more prone to relapse, females (especially those who smoke <10 cigarettes per day), blacks and those with higher dependency. In addition, it can reduce cancer-related fatigue, depression and abstinence induced negative mood especially among highly dependent smokers^{19,25}. Thus, this agent may be a good choice for lung cancer patients who are also experiencing depression.

Varenicline is the newest pharmacological cessation aide approved in 2006. This drug works by attenuating nicotine's effect on dopamine release, while maintaining dopaminergic tone. It is a selective alpha 4, beta 2, neuronal nicotinic achetylcholine receptor partial agonist. It exhibits both agonist and antagonist function, which inhibit craving and withdrawal while attenuating the reinforcing effects of nicotine. In clinical trials, varenicline achieved quit rates four times higher than placebo and double the rate of bupropion²⁶. Currently, there are no data available about the use of varenicline and tobacco cessation outcomes among patients with cancer. However, since nausea is a potential side effect of varenicline, it may not be the most appropriate agent for those undergoing active cancer treatment, such as cisplatin, that may also have this side effect.

Behavioral Counseling—Behavioral counseling programs are a necessary part of TDT programs because pharmacological cessation aides and behavioral counseling each independently increase cessation rates. Skills training that includes: social support, counseling about cognitive and behavioral ways to cope with smoking urges and general information about tobacco dependence are used to enhance pharmacotherapy. Most patients with lung cancer who smoke have tried to quit smoking before their diagnosis and assessment of reasons for relapse will be helpful in providing additional counseling. Higher quit rates are achieved with increasing intensity of behavioral counseling. Four to seven person to person contact sessions during a period of at least 8 weeks, with counseling sessions lasting at least 10 minutes are optimal for enhancing smoking cessation rates⁸.

To date, there are few randomized clinical trials examining behavioral treatments in combination with TDT for lung cancer patients²⁷. For highly dependent smokers, the use of tailored intensive interventions may be beneficial. This type of approach combines behavioral interventions with pharmacological cessation aides and focuses the intervention on specific needs of the subgroup of smokers. One of the problems with intensive interventions, however, is that not all patients may be interested or able to participate in this approach. Thus, other innovative interventions need to be examined. The use of telephone counseling has been shown to be effective among the general population²⁸. Telephone counseling is now available in every state through out the United States (1-800-Quit Now). Evidence has shown that proactive counseling helps motivated smokers stay abstinent and that three or more calls increase the odds of quitting as compared to standard self-help or brief health care provider advice.

Barriers to Incorporating Interventions into the Clinical Setting—Nurses can make an enormous difference in tobacco control. If each of the 2.2 million nurses working in the US helped one smoker quit per year, they would triple the US quit rate²⁹. In order to make this happen, routine assessment and treatment of tobacco must be integrated into clinical practice. Recent advances in providing reimbursement for TDT provide further incentive for integration of these services into clinical practice. Medicare and Medicaid coverage is now available for intermediate and intensive TDT counseling. In addition, the percentage of insurers providing full coverage for pharmacological cessation aides has more than tripled from 1997 to 2002³⁰. Potential barriers for incorporating TDT into practice are the lack of knowledge about TDT interventions in cancer patients, lack of training, and continued smoking among nurses. Patient-related barriers, such as perceived stigma associated with a smoking-related cancer and

continued smoking among family members, may also play a role in preventing effective delivery of cessation interventions.

Wewers and colleagues conducted a series of small studies in lung cancer patients^{31–33}. The collective results from these studies suggest that nurse delivered TDT interventions improve cessation rates. Further studies are needed to test interventions specifically designed for lung cancer patients. In the meantime, intervention components from the general population are readily applicable to lung cancer patients.

Adequate training in providing TDT is essential for nurses to be able to successfully incorporate these interventions into their practice. Although, Wewers and colleagues³⁴ found limited coverage of TDT in their survey of nursing programs, new resources are now available for practicing nurses (see Table 4). Several years ago, Sarna et al³⁵ identified that although most oncology nurses encounter smokers in their practice, only 10% had heard of the *Guideline* for TDT. The majority of nurses wanted to help patients quit smoking but needed further training. This study also found that, similar to other health care professionals, nurses who smoke were less likely to intervene with patients. These findings underscore the importance of integrating education about TDT into nursing schools, providing continuing education about tobacco cessation within practice settings, and supporting smoking cessation programs for health care professionals. The Tobacco Free Nurses (www.tobaccofreenurses.org) initiative provides resources for nurses to use in helping patients quit as well as support for nurses and student nurses who want to quit smoking.

Some health care providers may expect that the diagnosis of cancer alone will provide enough motivation for patients to quit smoking. It is essential to understand the highly addictive nature of tobacco dependence and the fact that some patients will require repeated TDT over time to be successful in their cessation efforts. Thus, nurses must approach TDT in lung cancer patients with sensitivity. Patients may be embarrassed and not willing to disclose their smoking status because of the stigma that is associated with a smoking related malignancy. Sharing information with patients that quitting smoking may be difficult but assuring them of the benefits and that effective TDT are available may enhance their comfort.

The time surrounding a diagnosis of cancer may enhance family members' willingness to quit smoking. Thus, assessment of family smoking and offering clinical interventions to other family members may also enhance patient success with quitting and potentially improve the health of family members by preventing tobacco related comorbidities.

Conclusion

Smoking cessation after the diagnosis of lung cancer is essential to improve clinical outcomes. Although effective TDT are available to help smokers quit smoking, persistent efforts over repeated contacts may be necessary to achieve long-term cessation. Oncology nurses have the potential to make an enormous difference in the successful integration of tobacco dependence services into clinical settings. Further knowledge and training in TDT is needed to make this a reality.

Acknowledgements

This work was supported in part by grants from the National Cancer Institute (Grant #1K07 CA92692, Mary E. Cooley, PI)

References

1. American Cancer Society. Cancer Facts and Figures-2007. Atlanta: American Cancer Society; 2007.

2. Richardson GE, Tucker MA, Venzon DJ, et al. Smoking cessation after successful treatment of small-cell lung cancer is associated with fewer smoking-related second primary cancers. *Ann Intern Med* 1993;119:383–90. [PubMed: 8393311]
3. Johnston-Early A, Cohen M, Minna J, et al. Smoking abstinence and small cell lung cancer survival: An association. *JAMA* 1980;244:2175–79. [PubMed: 6252357]
4. Garces Y, Yang P, Parkinson J, et al. The relationship between cigarette smoking and quality of life after lung cancer diagnosis. *Chest* 2004;126:1733–41. [PubMed: 15596667]
5. Sanderson Cox L, Africano NL, Tercyak KP, Taylor KL. Nicotine dependence treatment for patients with cancer. *ACS* 2003;98
6. Cooley ME, Sarna L, Brown JK, et al. Tobacco use in women with lung cancer. *Ann Behav Med* 2007;33:242–50. [PubMed: 17600451]
7. Centers for Disease Control and Prevention. State-Specific Prevalence of Current Cigarette Smoking Among Adults and Secondhand Smoke Rules and Policies in Homes and Workplaces. *MMWR Morb Mortal Wkly Rep* 2006;55:1148–51. [PubMed: 17065980]
8. US Department of Health and Human Services. Clinical Practice Guideline: Treating Tobacco Use and Dependence A report from the surgeon general. US Department of Health and Human Services, Public Health Services, Office of the Surgeon General; 2000.
9. Stewart AL, King AC, Killen JD, Ritter PL. Does smoking cessation improve health-related quality of life. *Ann Behav Med* 1995;17:331–38.
10. Moller AM, Villebro N, Pedersen T, Tonnesen H. Effect of preoperative smoking intervention on postoperative complications: A randomized clinical trial. *Lancet* 2002;359:114–17. [PubMed: 11809253]
11. Barrera RS, Amar W, Thaler D, et al. Smoking and timing of cessation: Impact on pulmonary complications after thoracotomy. *Chest* 2005;127:1977–83. [PubMed: 15947310]
12. Caporciyan A, Merriman KW, Ece F, et al. Incidence of major pulmonary morbidity after pneumonectomy: Association with timing of smoking cessation. *Ann Thorac Surg* 2002;73:420–26. [PubMed: 11845853]
13. Monson JM, Stark P, Reilly JJ, et al. Clinical radiation pneumonitis and radiographic changes after thoracic radiation therapy for lung carcinoma. *Cancer* 1998;82:842–50. [PubMed: 9486572]
14. Sarihan S, Ilker E, Saran A, et al. Evaluation of infections in non-small cell lung cancer is associated with decreased chemoradiotherapy for limited-stage small-cell lung cancer is associated with decreased survival. *Cancer Detect Prev* 2005;29:181–88. [PubMed: 15829379]
15. Zevin S, Benowitz NL. Drug interactions with tobacco smoking. *Clin Pharmacokinet* 1999;36:425–38. [PubMed: 10427467]
16. Xu J, Huang H, Pan C, et al. Nicotine inhibits apoptosis induced by cisplatin in human oral cancer cells. *Int J Oral Maxillofac Surg* 2007;36:739–44. [PubMed: 17611077]
17. Quibell R, Baker L. Nicotine withdrawal and nicotine replacement in the palliative care setting. *J Pain Symptom Manage* 2005;30:205–07. [PubMed: 16183003]
18. U.S. Department of Health and Human Services, Public Health Services. The Health Consequences of Smoking: Nicotine Addiction: A report of the surgeon general. US Department of Health and Human Services, Public Health Services, Centers for Disease Control and Prevention, Center for Health Promotion and Education, Office of the Surgeon General; 1988.
19. Ebbert JO, Sood A, Hays JT, Dale LC, Hurt RD. Treating tobacco dependence: Review of the best and latest treatment options. *J Thorac Oncol* 2007;2:249–56. [PubMed: 17410050]
20. Schneider NG, Koury MA, Cortner C, et al. Preferences among four combination nicotine treatments. *Psychopharmacology* 2006;187:476–85. [PubMed: 16896965]
21. Silagy C, Lancaster T, Stead L, Mant D, Fowler G. Nicotine replacement therapy for smoking cessation. *Cochrane Database Syst Rev* 2004;(3):CD000146. [PubMed: 15266423]
22. Lerman C, Kaufmann V, Rukstalis M, et al. Individualizing nicotine replacement therapy for the treatment of tobacco dependence: A randomized trial. *Ann Intern Med* 2004;140:426–33. [PubMed: 15023708]
23. Berrettini WH, Lerman CE. Pharmacotherapy and pharmacogenetics of nicotine dependence. *Am J Psychiatry* 2005;162:1441–51. [PubMed: 16055765]

24. Croghan IT, Hurt RD, Dakhil SR, et al. Randomized comparison of a nicotine inhaler and bupropion for smoking cessation and relapse prevention. *Mayo Clin Proc* 2007;82:186–95. [PubMed: 17290726]
25. Cullum JL, Wojciechowski AE, Pelletier G, Simpson JS. Bupropion sustained release treatment reduces fatigue in cancer patients. *Can J Psychiatry* 2004;49:139–44. [PubMed: 15065748]
26. Jorenby DE, Hays JT, Rigotti NA, et al. Efficacy of varenicline, an alpha4beta2 nicotinic acetylcholine receptor partial agonist, vs placebo or sustained-release bupropion for smoking cessation: a randomized controlled trial. *JAMA* 2006;296:56–63. [PubMed: 16820547]
27. Schnoll R, Rothman R, Wielt D, et al. A randomized pilot study of cognitive-behavioral therapy versus basic health education for smoking cessation among cancer patients. *Ann Behav Med* 2005;30:1–11. [PubMed: 16097900]
28. Stead LF, Perera R, Lancaster T. Telephone counseling for smoking cessation. *Cochrane Database Syst Rev* 2006;3:CD002850. [PubMed: 16855992]
29. Tobacco Free Nurses. 2007 [Accessed June 12, 2007]. Available at www.tobaccofreenurses.org
30. Theobald M, Jaen CR. An update on tobacco cessation reimbursement. *Fam Pract Manag* 2006;13:75–76. 78. [PubMed: 16736908]
31. Stanislaw A, Wewers M. A smoking cessation intervention with hospitalized surgical cancer patients: A pilot study. *Cancer Nurs* 1994;17:81–6. [PubMed: 8020001]
32. Browning K, Ahijevych K, Ross P. Implementing the agency for health care policy and research's smoking cessation guideline in a lung cancer surgery clinic. *Oncol Nurs Forum* 2000;27:1248–54. [PubMed: 11013905]
33. Wewers ME, Jenkins L, Mignery T. A nurse-managed smoking cessation intervention during diagnostic testing for lung cancer. *Oncol Nurs Forum* 1997;24:1419–21. [PubMed: 9380597]
34. Wewers ME, Kidd K, Armbruster D, Sarna L. Tobacco dependence curricula in U.S. baccalaureate and graduate nursing education. *Nurs Outlook* 2004;52:95–101. [PubMed: 15073590]
35. Sarna LP, Brown JK, Lillington L, et al. Tobacco interventions by oncology nurses in clinical practice: report from a national survey. *Cancer* 2000;89:881–89. [PubMed: 10951353]

Table 1**The Five A's Model to Facilitate Smoking Cessation**

Five A's Model Components	Use of Component in Clinical Practice
Ask about tobacco at each visit	<ul style="list-style-type: none"> Identify the tobacco use status at every visit. Place tobacco use status stickers on charts and in electronic medical records for easy viewing
Advise users to quit smoking	<p>Advice should be:</p> <ul style="list-style-type: none"> <i>Clear</i> "I think it is important for you to quit smoking now and I can help you" <i>Strong</i>: "As your nurse, I need to tell you that smoking cessation is one of the most important decisions you can make for your health." <i>Personalized</i>: Tie tobacco use to improved outcomes with lung cancer treatment
Assess readiness to quit smoking	<ul style="list-style-type: none"> If willing to quit, provide assistance. If unwilling to quit, use 5 R model to enhance motivation.
* Assist tobacco users with a quit plan	<p>Plan should include:</p> <ul style="list-style-type: none"> Set a quit date—ideally within 2 weeks. Inform family, friends and coworkers about quitting and request support and encouragement. Anticipate triggers and cues to smoking and identify alternative coping strategies. Alter the environment—throw away cigarettes, matches, lighters and try to remove smoke from clothes/car/furniture, avoid other smokers and drinking alcohol. <p>Inform the patient about pharmacological cessation aides Help patient seek outside support groups.</p>
Arrange for follow up	<ul style="list-style-type: none"> A follow up appointment should be made within the first week. Subsequent contact should occur a month after and others should be scheduled as indicated. Contact can be in person, email or telephone. Upon contact, be sure to congratulate success. If the patient has relapsed, review the circumstances and elicit a new strategy to quit. Remind the patient that a relapse can be used as a learning experience. Assess pharmacotherapy use and problems—consider more intensive treatment if necessary.

* Patients undergoing lung cancer treatment may not have adequate time to prepare for quitting and presents a unique challenge. Information from Treating Tobacco Use and Dependence Guideline⁸

Table 2
The Five R's Model for Enhancing Motivation to Quit Smoking

Five R's Model Component	Use of Component in Clinical Practice
Relevance	<ul style="list-style-type: none"> • Make an emphasis as to why quitting is important to improving clinical outcomes for lung cancer care. • Identify problems in past cessation efforts
Risks	<ul style="list-style-type: none"> • Assist the patient to identify potential negative consequences of continued tobacco use. The nurse should make it clear that switching to low tar cigarettes or other forms of tobacco, like smokeless tobacco or cigars, will not eliminate those risks. Potential risks: <ul style="list-style-type: none"> • <i>Acute Risks:</i> Worsened symptoms (i.e. shortness of breath, fatigue). Increased toxicity with cancer treatments • <i>Long-terms Risks:</i> Cancer recurrence, second primary cancer
Rewards	<ul style="list-style-type: none"> • Assist the patient to identify potential benefits to quitting. Examples: <ul style="list-style-type: none"> • Improved health • Setting a good example for family members or children • Breath, home, car and clothing will smell better • Improved taste and smell • Save money • Feel better physically and enhanced performance in physical activities
Roadblocks	<ul style="list-style-type: none"> • Assist the patient to identify the obstacles to quitting and note counseling or pharmacotherapy options that could address these barriers. Examples of typical barriers: <ul style="list-style-type: none"> • Withdrawal symptoms • Lack of support from family and friends • Fear of failure • Enjoyment of tobacco • Depression
Repetition	<ul style="list-style-type: none"> • This motivational intervention should be repeated at every visit that the patient is still unwilling to quit. Patients' who have failed previously, should be assured that it takes most people a few times to successfully quit smoking.

Information from Treating Tobacco Use and Dependence Guideline⁸

Table 3

First-line Tobacco Dependence Treatment (Information from Treating Tobacco Use and Dependence Guideline, 8 and Ebbert et al)

Drug	Dosing & Prescribing Instructions	Precautions	Availability
NRT—Nicotine Patch	Treatment for 8 weeks based on cigarettes per day (cpd). ≥10cpd 21 mg patch/24 hours for 4 weeks, then 14 mg patch/24 hours for 2 weeks, then 7 mg patch/24 hours for 2 weeks. If patients experience sleep disruption, they should remove the 24-hour patch at bedtime or use the 16-hour patch.	<i>Skin reactions:</i> Skin reactions are usually mild and self-limiting, but may worsen over the course of therapy. Skin reactions can be treated by rotating patch sites or applying hydrocortisone cream (1%) or triamcinolone cream (0.5%). <i>Other side effects:</i> Insomnia	Nicoderm®CQ®, Nicotrol®, generic-OTC
NRT- Nicotine Nasal Spray	One spray to each nostril 1–2 times/hour. Recommended treatment is between 8 and 40 doses/day. Recommended duration of treatment is 3–6 months. Fastest delivery of nicotine	<i>Nasal Irritation:</i> Nasal congestion and transient changes in sense of smell and taste were reported. The majority of users reported moderate to severe nasal irritation within the first two days	Nicotrol® NS- Prescription only
NRT-Inhaler	One dose from the inhaler consists of a puff or inhalation. Recommended dosage is 6–16 cartridges/day (each cartridge deliver 4mg of nicotine over 80 inhalations). Recommended duration of therapy is up to 6 months Acidic beverages (coffee, juices, soft drinks) interfere with the buccal absorption of nicotine, so these should be avoided 15 minutes before and during inhalation.	<i>Local irritation reactions:</i> Local irritation in the mouth and throat was observed in 40% of the patients. Coughing and rhinitis were also reported, but the frequency of symptoms declined with continued use.	Nicotrol® Inhaler-Prescription only
NRT-Nicotine gum	The 2mg gum is recommended for patients smoking < 25 cpd, while the 4mg gum is recommended for the patients smoking ≥ 25 cpd. No more than 24 pieces/day should be consumed. Can be used up to 12 weeks. Gum should be chewed slowly until a “minty” taste emerges, then “parked” between cheek and gum to facilitate nicotine absorption. Eating and drinking anything except water should be avoided for 15 minutes before and during chewing	<i>Side Effects:</i> Mouth soreness, hiccups, dyspepsia, jaw ache	Nicorette® (Original, Mint, FreshMint™, FruitChill™) -OTC
NRT- Commit Lozenge	Dosing is based on time to first cigarette; < 30 minutes of waking up, 4mg lozenge; > 30 minutes, 2mg. Recommended dose: Weeks 1–6; 1 lozenge every 1–2 hours. Weeks 7–9; take 1 lozenge every 2–4 hours. And weeks 9–12; 1 lozenge every 4–8 hours. Do not consume more than 1 lozenge at a time, with a maximum of 5 lozenges in 6 hours. Allow the lozenge to slowly dissolve in their mouth. Avoid chewing or swallowing lozenge. A tingling sensation may be experienced during consumption, which indicates that it is working. Occasionally shift the lozenge from either side of the mouth during the 20–30 minute time period in which it takes to fully dissolve. Do not eat or drink 15 minutes before using, or while using the lozenge.	<i>Side Effects:</i> may include heart palpitations, nausea, vomiting and weakness.	Commit® Lozenge (mint or cherry)-OTC
Bupropion SR	Begin 1–2 weeks before target quit date (TQD). Start with a dose of 150mg q AM for 3 days, then increase to 150mg b.i.d for 4 days. On TQD, continue dosing at 150mg b.i.d. for 7–12 weeks. Maintenance therapy may last up to 6 months. Some patients will lose their desire to smoke prior to their quit date, or will spontaneously reduce the amount they smoke. If insomnia is marked, take the PM dose earlier in the afternoon. Use alcohol in moderation.	<i>Cardiovascular disease:</i> generally well tolerated, infrequent reports of hypertension <i>Side Effects:</i> most commonly reported are insomnia and dry mouth <i>Contraindications:</i> Seizure disorder, eating disorder, using another form of bupropion or used an MAOI in the past 14 days	Zyban®—Prescription only
Vareceline	Start taking 1 week before TQD. Days 1–3, 0.5 mg q.d., then take 0.5 b.i.d for 4 days; On TQD 1.0 mg b.i.d. daily for 11 weeks. Take with food.	<i>Side effects:</i> mild to moderate nausea, vomiting, sleep disturbances, constipation and gas. Risks of toxicity may be increased in patients with impaired renal function.	Chantix®-Prescription only, no generics available at this time

Table 4

Tobacco Cessation Resources

Consumer Resources for Tobacco Cessation		
Name	Services Provided	Contact Information
Agency for Healthcare Research and Quality	Links to the Public Health Services guideline for science-based cessation	http://www.ahrq.gov/consumer/#smoking
American Cancer Society	Information about tobacco-attributable cancers, tobacco control, and policy issues. Materials such as "How to Quit" or "You Can Stop Smoking" are available on the web or for order. Available cessation programs are FreshStart and SmartMove	http://www.cancer.org/docroot/PED/ped_10_3.asp?sitearea=PED 1-800-ACS-2345
The American Legacy Foundation	Main objectives are to arm all young people with the knowledge and tools to reject tobacco, and to eliminate disparities in access to tobacco prevention and cessation services	http://www.americanlegacy.org
American Lung Association (ALA)	Conducts programs addressing smoking cessation, prevention, and the protection of nonsmokers' health, and provides a variety of educational materials for the public	http://www.lungusa.org
Centers for Disease Control and Prevention, Office of Smoking and Health	Information and links to all major reports on different aspects of tobacco and health, and cessation materials	http://www.cdc.gov/tobacco/
National Quitline	The hotline provides private support, personalized methods for cessation and skills to help break the habit	http://quitnow.com/ 1-800-quitnow
QuitNet	Internet based quit smoking resource, with a free of charge and a paid plan	http://www.quitnet.com
NCI Smokefree Site	Provides electronic, printed, or telephone resources for cessation, along with information on current clinical trials for smokers to participate in	http://www.smokefree.gov
Healthcare Provider Resources for Tobacco Cessation		
Name	Services Provided	Contact Information
Agency for Healthcare Research and Quality-Clinical Practice Guidelines: Treating Tobacco Use and Dependence	This guideline contains strategies designed to assist clinicians, tobacco dependence treatment specialists, and administrators in delivering effective treatments for tobacco use and dependence.	http://www.ahrq.gov/path/tobacco.htm
Association for the Treatment of Tobacco Use and Dependence (ATTUD)	Holds annual conferences for information exchange on best available cessation practice, innovations in treatments, and gaps in tobacco cessation	http://www.attud.org
National Cancer Institute	Information about NCI's tobacco-related research, the smoking quitline, websites, and publications with information on smoking cessation and prevention	http://www.cancer.gov/cancertopics/smoking 1-800-4-CANCER
Program Training and Consultation Centre	Provides several training materials and resources—Nursing Best Practice Guideline developed by the Registered Nurses Association of Ontario, e-learning module	http://www.ptcc-cfc.on.ca/index.cfm
Rx for Change	Clinician-assisted tobacco cessation training program for clinicians based upon the Tobacco Dependence Guidelines	http://rxforchange.ucsf.edu/
Treat Tobacco: Database & Educational Resource for Treatment of Tobacco Dependence	Site aimed at cessation resources for health professionals, highlighting efficacy, safety, demographics & health effects, health economics and policy	http://www.treattobacco.net
Tobacco Free Nurses	The first ever national program focused on helping nurses to stop smoking. Links to many programs and resources, including a comprehensive database of articles about nurses and smoking cessation	http://www.tobaccofreenurses.org
World Health Organization, Tobacco Free Initiative	The United Nations agency responsible for health. Links to several policy and	http://tobacco.who.int/

Consumer Resources for Tobacco Cessation		
Name	Services Provided	Contact Information
	treatment guideline for tobacco control and smoking cessation	