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NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®)

Smoking Cessation

Version 1.2015

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Clinical Trials: NCCN believes that the best management for any cancer patient is in a clinical trial. Participation in clinical trials is especially encouraged.

To find clinical trials online at NCCN Member Institutions, [click here: nccn.org/clinical_trials/physician.html](#).

NCCN Categories of Evidence and Consensus: All recommendations are category 2A unless otherwise specified.

See [NCCN Categories of Evidence and Consensus](#).

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GENERAL PRINCIPLES OF THE SMOKING CESSATION GUIDELINES

These guidelines are focused on smoking cessation recommendations for patients with cancer. There are health benefits to smoking cessation even after a cancer diagnosis, regardless of stage or prognosis, namely improvement in cancer treatment outcomes, disease recurrence, and secondary cancers. It is never too late for patients with cancer to stop smoking cigarettes. Smoking and nicotine addiction is a chronic relapsing disorder. Patients may slip or relapse, which is expected and can be managed. Smokers with cancer often demonstrate high-level nicotine dependence. The NCCN Panel recommends that treatment plans for all smokers with cancer include the following:

1. Evidence-based pharmacotherapy,
2. Behavior therapy (counseling), and
3. Close follow-up with retreatment as needed.

Clinical Recommendations:

- Pharmacologic therapy is effective and recommended.
 - ▶ The two most effective pharmacotherapy agents are combination nicotine replacement therapy (NRT) and varenicline. Therapies can be combined as needed.
- Combining pharmacologic therapy and counseling is the most effective and leads to the best results for smoking cessation.
 - ▶ High-intensity behavior therapy with multiple counseling sessions is most effective, but at least a minimum of brief counseling is highly recommended.
- Smoking status should be documented in the patient health record. Patient health records should be updated at regular intervals to indicate changes in smoking status, quit attempts made, and interventions utilized.
- Smoking relapse and brief slips are common. Providers should discuss this and provide guidance and support to encourage continued smoking cessation attempts. Smoking slips are not necessarily an indication to try an alternative method. It may take more than one quit attempt with the same therapy to achieve long term cessation.

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EVALUATION AND ASSESSMENT OF PATIENT SMOKING^a

INITIAL EVALUATION^b

STATUS

Assess current cigarette smoking status of all patients with cancer:^{b,c,d}

- Have you ever smoked cigarettes?
- Do you currently smoke cigarettes or have you smoked in the last 30 days?

Current smoker and/or those who have smoked within the last 30 days

→ [See Assessment of Current Smokers \(SC-2\)](#)

Former smoker or recently quit (>30 days since patient last smoked)

→ [See Assessment of Former Smokers \(SC-3\)](#)

Never smoked or long-term former smoker

→ Encourage patient to remain smoke-free

^aFor the purposes of this guideline, "smoking" refers to cigarette use.

^bInitial evaluation and assessment of patient smoking may be completed by any member of the health care team, including physicians, nurses, medical assistants, health educators, or other dedicated staff.

^cSmoking status should be documented in the patient health record and assessment should be repeated at every visit (less often for patients with remote smoking histories).

^dSmoking cessation should be offered to all smokers with cancer regardless of cancer prognosis. [See Smoking-Associated Risks for Patients With Cancer \(SC-A\)](#).

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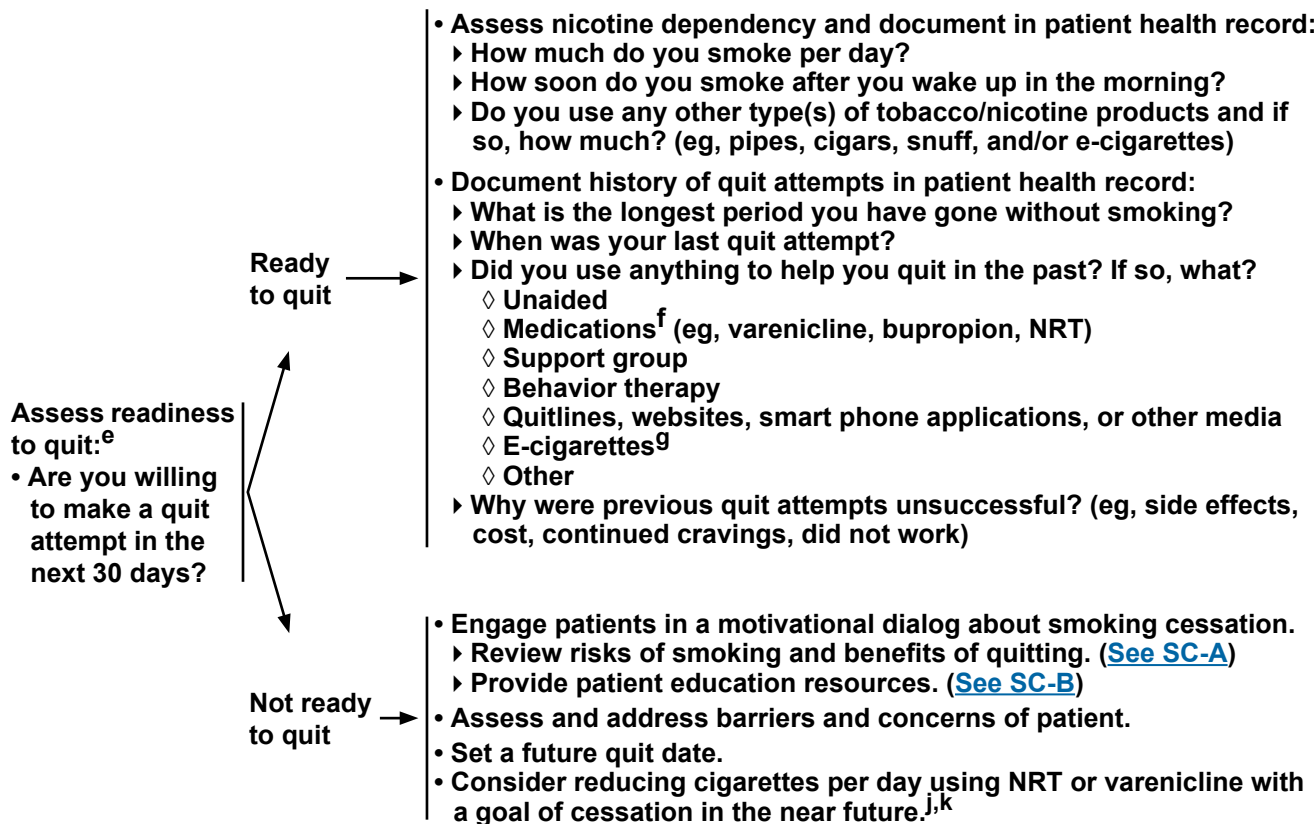


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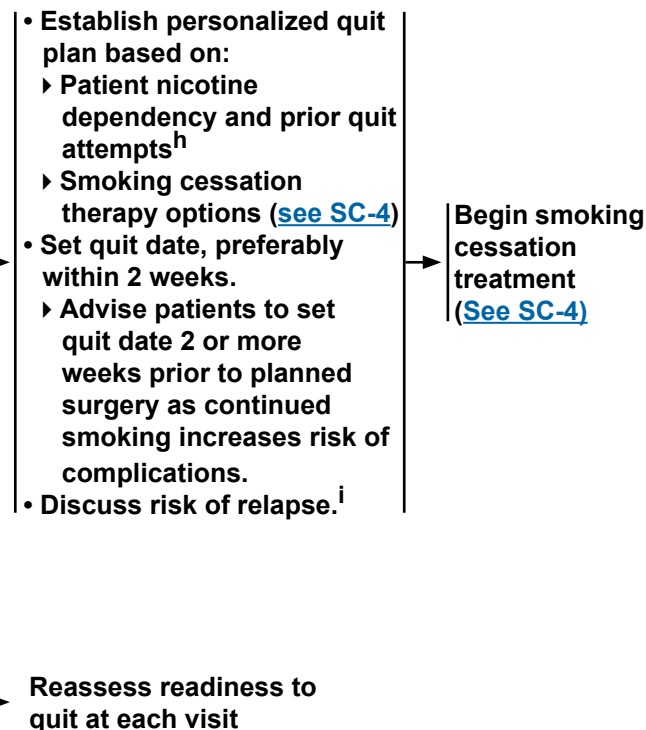
Smoking Cessation

CURRENT SMOKERS (Smoked Within Last 30 Days) EVALUATION AND ASSESSMENT

EVALUATION



MANAGEMENT



^ePhysicians and members of the health care team should discuss potential risks and benefits of quitting with each patient. Readiness to quit is to be determined by both physician and patient.

^fDocument type and dose of medications used during previous quit attempts.

^gThere is currently insufficient evidence to support the use of electronic nicotine delivery systems (e-cigarettes) in smoking cessation for patients with cancer.

^hAdjustments to therapy length, intensity, and surveillance may be considered, as clinically indicated, for patients with high nicotine dependency and/or prior unsuccessful quit attempts.

ⁱProviders should discuss risk of relapse and smoking slips and provide guidance and support to encourage continued smoking cessation attempts.

^jMaking an immediate quit attempt is preferred but smoking reduction may be considered with a goal of cessation. Setting a future quit date is preferred (ie. 1-3 mo).

^k[See Principles of Smoking Cessation Pharmacotherapy \(SC-C\)](#)

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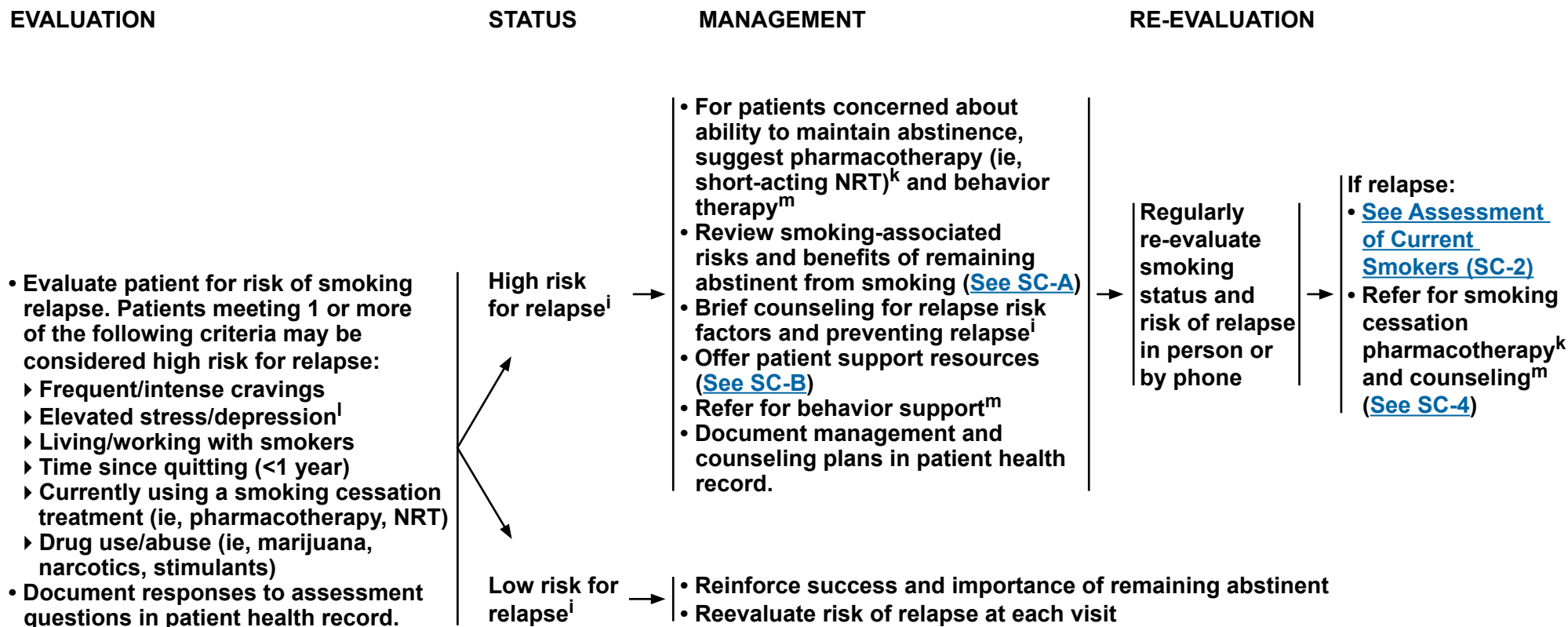
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Smoking Cessation

FORMER SMOKERS AND RECENT QUITTERS (>30 Days Since Last Smoked) EVALUATION AND ASSESSMENT



ⁱProviders should discuss risk of relapse and smoking slips and provide guidance and support to encourage continued smoking cessation attempts.

^k[See Principles of Smoking Cessation Pharmacotherapy \(SC-C\).](#)

^lEvaluate patient for psychiatric comorbidities and refer to specialist if indicated.

^m[See Principles of Behavior Therapy \(SC-D\).](#)

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Smoking Cessation

GENERAL APPROACH TO SMOKING CESSATION DURING CANCER TREATMENT

FIRST-LINE THERAPY^{n,o,p}

Pharmacotherapy^k + Behavior Therapy^m

- Combination NRT^{k,q} (12 wk) + individual/group therapy (4 or more sessions)^m or
- Varenicline^{k,r,s} (12 wk) + individual/group therapy (4 or more sessions)^m

FOLLOW-UP

- Follow-up in person or by phone within 2 weeks to assess efficacy and toxicity of pharmacotherapy.
 - ▶ May be done during individual/group therapy
- Assess risk for relapse of recent quitters and consider adjustments to dose and/or type of pharmacotherapy.^k
- Encourage continued therapy and provide support for brief slips; adjusting therapy may or may not be needed.
- Additional/close follow-up during remaining therapy.

SURVEILLANCE

Assess smoking status in person or by phone at 12 weeks, and at the end of pharmacotherapy if longer than 12 weeks.^{k,p}

Smoke-free

Relapse

ADDITIONAL THERAPY AND/OR FOLLOW-UP

- Second-line therapy:^k
 - ▶ Varenicline^{r,s} + combination NRT^q or
 - ▶ Bupropion^s + combination NRT^q
- Continue individual/group therapy^m

Additional follow-up in person or by phone at 6 and 12 months

- As clinically indicated, consider:
 - ▶ Extended use of pharmacotherapy for more than 12 weeks^{k,p}
 - ▶ Third-line therapy^k
 - ▶ Addition of more intensive or extended behavior therapy^m
- Assess smoking status in person or by phone at the end of pharmacotherapy
- Additional follow-up at 6 and 12 months

^kSee Principles of Smoking Cessation Pharmacotherapy (SC-C).

^mSee Principles of Behavior Therapy (SC-D).

ⁿEfficacy data are lacking for the use of e-cigarettes and alternative therapies (eg, hypnosis, acupuncture, nutritional supplements). Patients should be encouraged to use evidence-based cessation methods to avoid delay in achieving smoking abstinence. See SC-C (2 of 2).

^oThe use of marijuana, or other substances associated with smoking relapse, is discouraged for those attempting to quit smoking.

^pTherapy may be extended to promote continued cessation (ie, 6 mo–1 yr) while attempting to avoid extended therapy if possible.

^qCombination NRT is defined as the use of nicotine patch + short-acting NRT (gum/lozenge/inhaler/nasal spray).

^rNausea is a common side effect of varenicline and may need to be managed for patients with cancer, especially during chemotherapy.

^sIf prescribing varenicline or bupropion, document patient's history of mental illness or suicidal ideation.

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SMOKING-ASSOCIATED RISKS FOR PATIENTS WITH CANCER (1 of 2)

- The 2014 Surgeon General's Report¹ stated that:
 - ▶ Sufficient evidence exists to support a causal relationship between smoking and adverse health outcomes, increased all-cause mortality and cancer-specific mortality, and increased risk for secondary primary cancers.
 - ▶ Existing evidence is suggestive of a link between smoking and increased risk of cancer recurrence, poor treatment response, and increased treatment-related toxicity.
- Providers should:
 - ▶ Inform patients of the potential benefits of smoking cessation, including improved survival, treatment outcomes, and health-related quality of life, as well as decreased treatment-related toxicity, drug side effects, and surgical complications.
 - ▶ Educate patients on the specific risks of smoking during treatment for their particular cancer.
 - ▶ Encourage smoking cessation as far in advance as possible before initiating cancer treatment.
 - ▶ Consider patient smoking status, prior to initiating treatment, when making decisions regarding treatment selection, dosage, and timing of initiation.

Treatment-Specific Risks (see [Discussion](#) for additional information)

- Smoking can impact the metabolism of chemotherapy and targeted therapy.
 - ▶ Smoking effects on cytochrome P450 enzymes may include altered drug clearance time and plasma concentration, potentially impacting the efficacy of certain drugs for patients who smoke. Providers should consider whether patients are at risk for altered drug metabolism due to smoking and determine if medication or dose adjustments may be required. Drugs whose metabolisms are known to be affected include erlotinib and irinotecan.²⁻⁴
- Smoking increases risk of radiation therapy (RT)-associated treatment complications during RT and may decrease treatment response.⁵⁻⁷
- Smoking is associated with increased rates of postoperative complications and mortality after cancer surgery.
 - ▶ Compared with nonsmokers, patients who smoke may experience decreased health-related quality of life after cancer surgery (eg, dyspnea, fatigue, pain).⁸⁻¹⁰
 - ▶ Smoking may impair wound healing following surgery for cancer.^{11,12}
 - ▶ Increased infection rates, pulmonary complications, and longer postoperative hospital stays are more commonly observed in patients who smoke.¹³
 - ▶ Postoperative mortality rates are higher among patients who smoke.¹⁴

Potential Nicotine Effects on Cancer and Cardiovascular Risks (see [Discussion](#) for additional information)

- Blood nicotine levels from NRT, including combination NRT, are significantly less than from smoking cigarettes. Therefore, providers and smokers should not be dissuaded from using NRT to foster quitting and long-term cessation. The use of combination NRT as one type of pharmacotherapy is recommended.
- There is insufficient evidence that NRT causes cancer in humans.¹⁵⁻¹⁹
- While myocardial infarction has rarely been reported in NRT users, there is insufficient evidence that NRT increases the risk of myocardial infarction or cardiovascular disease.

[References on next page](#)

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**SMOKING-ASSOCIATED RISKS FOR PATIENTS WITH CANCER (2 of 2)****REFERENCES**

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SMOKING CESSATION RESOURCES FOR HEALTHCARE PROVIDERS AND PATIENTS (1 of 2)

Quitlines/Online Support/Mobile Apps	
American Lung Association	<ul style="list-style-type: none"> • 1-800-LUNGUSA (1-800-586-4872) • Live Help (Online Chat)- http://www.lung.org/about-us/lung-helpline.html
National Network of Tobacco Cessation Quitlines	1-800-QUIT-NOW (1-800-784-8669)
National Cancer Institute (NCI)	<ul style="list-style-type: none"> • 1-877-448-7848 • Live Help (Online Chat)- https://livehelp.cancer.gov/app/chat/chat_launch
Smokefree.gov	<ul style="list-style-type: none"> • SmokefreeTXT (Text messaging support)- http://smokefree.gov/smokefreetxt • Smokefree Apps (for smartphones)- http://smokefree.gov/apps-quitstart
TRICARE (For military service members and their families)	<ul style="list-style-type: none"> • Quitlines: North: 1-866-459-8766; South: 1-877-414-9949; West: 1-888-713-4597 • http://www.tricare.mil/HealthWellness/Tobacco.aspx
Quit Tobacco: UCANQUIT2.org	<ul style="list-style-type: none"> • Live chat with quit coach: http://www.ucanquit2.org • SmokefreeMIL text message support: http://www.ucanquit2.org/en/HowToQuit/SmokefreeMIL.aspx
General Information Online	
American Heart Association	http://www.heart.org/HEARTORG/GettingHealthy/QuitSmoking/Quit-Smoking_UCM_001085_SubHomePage.jsp
American Lung Association	http://www.lung.org/stop-smoking/
Centers for Disease Control and Prevention (CDC)	http://www.cdc.gov/tobacco/quit_smoking/how_to_quit/resources/index.htm
NCI	http://www.cancer.gov/cancertopics/tobacco/smoking
SmokeFree.gov	http://smokefree.gov
Smoking Cessation Programs	
American Lung Association	http://www.lung.org/stop-smoking/how-to-quit/freedom-from-smoking/
Ex: A New Way To Think About Quitting Smoking	http://www.becomeanex.org/
Guides to Quitting	
American Cancer Society (ACS)	http://www.cancer.org/healthy/stayawayfromtobacco/guidetoquittingsmoking/index
NCI: "Clearing the Air: Quit Smoking Today"	http://smokefree.gov/sites/default/files/pdf/clearing-the-air-accessible.pdf

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SMOKING CESSATION RESOURCES FOR HEALTHCARE PROVIDERS AND PATIENTS (2 OF 2)

Additional Resources for Health Professionals	
American Association for Cancer Research (AACR)	http://www.aacr.org/AdvocacyPolicy/GovernmentAffairs/Documents/AACRStatementTobaccoUseCancerPatients_2013_CCR_f3f578.pdf
American College of Chest Physicians (ACCP)	Tobacco dependence treatment toolkit: http://tobaccodependence.chestnet.org/
American Society of Clinical Oncology (ASCO)	Tobacco cessation and control resources: http://www.asco.org/practice-research/tobacco-cessation-and-control-resources
Association for the Treatment of Tobacco Use and Dependence (ATTUD)	<ul style="list-style-type: none"> • http://www.attud.org/ • List of ATTUD accredited training programs: http://attudaccred.org/programs
NCCN Guidelines for Lung Cancer Screening	http://www.nccn.org/professionals/physician_gls/pdf/lung_screening.pdf
NCCN Guidelines for Survivorship	http://www.nccn.org/professionals/physician_gls/pdf/survivorship.pdf
NCI- Physician Data Query: "Smoking In Cancer Care"	http://www.cancer.gov/cancertopics/pdq/supportivecare/smokingcessation/HealthProfessional
Smokefree.gov	http://smokefree.gov/health-care-professionals
Treatobacco.net	http://www.treatobacco.net/en/index.php
U.S. Department of Health and Human Services- Surgeon General Reports	http://www.surgeongeneral.gov/initiatives/tobacco/index.html#1960

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Smoking Cessation

PRINCIPLES OF SMOKING CESSATION PHARMACOTHERAPY (1 of 2)

Pharmacotherapy Options

First-Line	<ul style="list-style-type: none"> • Combination NRT <ul style="list-style-type: none"> ▸ Nicotine patch + short-acting NRT (lozenge/gum/inhaler/nasal spray) • Varenicline^a
Second-Line	<ul style="list-style-type: none"> • Varenicline + combination NRT • Bupropion + combination NRT
Third-Line	<ul style="list-style-type: none"> • Varenicline + bupropion ± NRT • Nortriptyline (tricyclic antidepressant) • Clonidine (antihypertensive, alpha-2 adrenergic receptor agonist)

Standard Dosing Information

	Standard Dose ^b	Duration	Drug Warnings and Contraindications
Varenicline	<ul style="list-style-type: none"> • Initiate dosing 1-2 wk prior to quitting • 0.5 mg orally, once daily on days 1–3 • 0.5 mg orally, twice daily on days 4–7 • 1 mg orally, twice daily from week 2–12, if tolerated 	12 weeks ^c	Providers should monitor for the development or worsening of serious neuropsychiatric issues, including those without a previous history, and discontinue use if these signs occur. See Manufacturer Black Box Warning, and weigh the substantial benefits of immediate smoking cessation versus risks of increased hostility, depression, or suicidal behavior. ¹
Bupropion	<ul style="list-style-type: none"> • Initiate dosing 1-2 wk prior to quitting • 150 mg orally, once daily on days 1–3^d • 150 mg orally, twice daily (300 mg daily) starting on day 4, if tolerated • Maximum 300 mg per day 	7–12 weeks ^c	Providers should monitor for the development or worsening of serious neuropsychiatric issues, including those without a previous history, and discontinue use if these signs occur. See Manufacturer Black Box Warning, and weigh the substantial benefits of immediate smoking cessation versus risks of increased hostility, depression, or suicidal behavior. ² • Contraindicated for patients with seizure risks (ie, stroke, brain metastases), those taking MOA inhibitors (increased risk of hypertensive reactions) or tamoxifen, those with closed-angle glaucoma.
Combination NRT	<ul style="list-style-type: none"> • 21 mg patch + short-acting NRT • If 21 mg patch is not effective, consider increasing patch dose to 35 or 42 mg, as clinically indicated 	12 weeks ^c	Blood nicotine levels from NRT, including combination NRT, are significantly less than from smoking cigarettes. NRT is well tolerated and nicotine toxicity is rare and transient, even when used with smoking.

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^aNausea is a common side effect of varenicline and may need to be managed for patients with cancer, especially during chemotherapy.

^bDose adjustments may be considered, if clinically indicated.

^cTherapy may be extended to promote continued cessation (ie, 6 months– 1 year) while attempting to avoid longer periods of time if possible.

^dDose adjustment for hepatic or renal insufficiency.

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PRINCIPLES OF SMOKING CESSATION PHARMACOTHERAPY (2 of 2)

Side Effects of Smoking Cessation Medications:

In most circumstances the side effects related to all first-line smoking cessation medications are minimal and are considered an acceptable risk compared to smoking. Serious side effects are extremely rare. Providers should refer to manufacturer inserts for exhaustive lists of potential side effects and warnings.^{1,2}

Use of E-Cigarettes and Complementary/Alternative Medicine:

- There is currently insufficient evidence to support the use of e-cigarettes in smoking cessation, because efficacy data are lacking for the use of e-cigarettes and alternative therapies (eg, hypnosis, acupuncture, nutritional supplements) alone or in combination with standard smoking cessation methods. Therefore, the use of specific alternative therapies is not recommended.
- Patients should be encouraged to use evidence-based cessation methods to avoid delay in achieving smoking abstinence. Prior unsuccessful quit attempts with conventional therapies do not justify the use of unproven alternative cessation methods. Relapse and smoking slips are common, so repeated attempts are frequently needed.
- When considering alternative therapies, providers should counsel patients on potential interactions with evidence-based cessation methods and/or cancer treatments.

¹National Institutes of Health. Varenicline (Chantix) drug label and full prescribing information. Available at: <http://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=d52bc40b-db7b-4243-888c-9ee95bbc6545> Accessed March 09, 2015.

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**PRINCIPLES OF BEHAVIOR THERAPY (1 of 2)**

- **Pharmacotherapy is most effective when combined with behavior therapy.¹ In addition to the benefits of enhancing motivation and knowledge of the addiction process, behavior therapy assists patients with medication use and strategies since adherence to tobacco treatment medication recommendations is often inadequate. More intensive therapy, with a dose-response effect, is preferred over brief advice; however, brief advice, at minimum, should be delivered.**
- **Counseling can be in-person and/or by phone, or within a group, and include print or web-based materials. Behavior therapy, tailored somewhat to the patient's nicotine dependence and previous quit attempts, provides strategies for coping with nicotine withdrawal, identifying smoking triggers, coping with stressful and difficult situations in which smoking is likely, avoiding high-risk situations as well as addressing other patient specific barriers to and facilitators of smoking behavior change.**
 - ▶ **Population-level studies of real-world effectiveness of smoking cessation treatment modalities indicate that counseling by a smoking cessation specialist plus medication results in a significant improvement in cessation rates relative to no counseling or medication (OR =3.25; CI, 2.05–5.15).² Therefore, OTC medication alone, without some form of counseling may not be better than unaided cessation.**
 - ▶ **Intensive therapy is 4 or more behavior intervention sessions (individual or group) that are each at least 10 minutes and usually 30 minutes or more in duration. They are provided by a trained tobacco treatment specialist, with skills training, social support, and motivational interviewing as interventional components.**
 - ▶ **Brief advice of about 3 minutes by physicians or other health care providers results in a small but important increase in quit rates.³**
 - ▶ **Refer to a smoking cessation quitline, in addition to providing brief counseling from a health care provider, if face-to-face or group intervention is not available. (See SC-B)**

Motivational counseling for patients unwilling to quit.^{3,4,5}

- **Motivational counseling includes exploring the smoker's feelings, beliefs, ideas and values in order to identify areas for change towards willingness to quit. Provide reasons, ideas and needs for cessation, with encouragement. It is important to be directive with a smoker, while using an empathic approach to help the smoker understand his/her reasons for smoking and build his/her confidence to quit. The four general principles to follow are: (1) express empathy, (2) develop discrepancy, (3) roll with resistance, and (4) support self-efficacy.⁴**

Behavior therapy for smoking cessation:^{3,5}

- **Through behavior therapy, smokers are provided with problem solving skills, support and encouragement. The elements include identifying risky situations (e.g., triggers for stress, drinking alcohol, being around other smokers, triggers for urges and other cues) and develop coping skills (avoid risky situations, provide cognitive strategies, short-acting NRT). Follow the same four general principles above. Note that nicotine withdrawal symptoms typically peak within 1-2 weeks after quitting and then subside.**
- **In smokers with cancer, there is a high incidence of depression, anxiety, and stress, all of which are common causes of relapse. It may be optimal to enroll patients in a behavior therapy program with specific interventions designed to ameliorate these conditions and other cancer-related relapse challenges. This may require referral to specialized smoking cessation programs that have staff trained to treat mental health disorders, or referral to behavior therapists who have expertise in treating co-morbid substance dependence and mental health disorders.**
- **Specialized treatment centers may consider providing smoking cessation therapy targeted specifically to patients with cancer (eg, individual therapy and group support that focuses on challenges specific to cancer survival and treatment) with access to counselors or group leaders experienced in the treatment of patients with cancer.**

Note: All recommendations are category 2A unless otherwise indicated.

Clinical Trials: NCCN believes that the best management of any cancer patient is in a clinical trial. Participation in clinical trials is especially encouraged.

[References on next page](#)



PRINCIPLES OF BEHAVIOR THERAPY (2 of 2)

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- ⁴Miller WR, Rollnick S. Motivational Interviewing: Preparing People for Change. New York, NY: Guilford Press; 2002.
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Discussion

NCCN Categories of Evidence and Consensus

Category 1: Based upon high-level evidence, there is uniform NCCN consensus that the intervention is appropriate.

Category 2A: Based upon lower-level evidence, there is uniform NCCN consensus that the intervention is appropriate.

Category 2B: Based upon lower-level evidence, there is NCCN consensus that the intervention is appropriate.

Category 3: Based upon any level of evidence, there is major NCCN disagreement that the intervention is appropriate.

All recommendations are category 2A unless otherwise noted.

DISCUSSION
UNDER
DEVELOPMENT