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## Patient information: Quitting smoking (Beyond the Basics)

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**Literature review current through:** Jan 2015. | **This topic last updated:** Nov 03, 2014.

**INTRODUCTION** — Cigarette smoking is a major cause of disease in the United States. More than 400,000 deaths occur each year as a result of cigarette smoking [1]. In addition, exposure to second-hand smoke is estimated to cause 40,000 deaths each year from heart disease and contributes to other diseases as well. Smoking is a major cause of non-fatal diseases including osteoporosis, skin wrinkling, peptic ulcer disease, impotence, and pregnancy complications.

Quitting and staying away from cigarettes is difficult, but not impossible. This topic review discusses the benefits of stopping smoking, treatments that can aid in the process of quitting, and the difficulties of relapse for those who try to quit.

**BENEFITS OF QUITTING SMOKING** — Smoking cessation has major and immediate health benefits for men and women of all ages. The earlier you quit, the greater the benefits. People who quit smoking before age 50 reduce their risk of dying over the next 15 years by one-half, as compared to those who continue to smoke. Smoking cessation is also important to those who do not smoke since being exposed to second-hand cigarette smoke is responsible for a number of serious health conditions.

**Cardiovascular disease** — Cigarette smoking doubles the risk of developing coronary heart disease, and smoking cessation can rapidly reduce this risk. One year after stopping smoking, the risk of dying from coronary heart disease is reduced by about one-half and continues to decline over time. In some studies, the risk of heart attack was reduced to the rate of nonsmokers within two years of quitting smoking.

**Pulmonary disease** — Smoking increases the risk of long-term lung diseases such as chronic obstructive pulmonary disease. While much of the lung damage caused by smoking is not reversible, stopping smoking can reduce further damage to the lungs, and many smokers with a chronic cough and sputum (phlegm coughed up from the lungs) note an improvement in these symptoms during the first year after stopping smoking. (See "[Patient information: Chronic obstructive pulmonary disease \(COPD\), including emphysema \(Beyond the Basics\)](#)".)

Asthma and sudden infant death syndrome (SIDS) are more common among children exposed to smoke. Cigarette smoking makes it more difficult to treat asthma.

**Cancer** — Cigarette smoking is responsible for almost 90 percent of cases of lung cancer. Smoking cessation reduces the risk of lung cancer within five years of stopping, although former smokers still have a higher risk of lung cancer than people who have never smoked. (See "[Patient information: Lung cancer risks, symptoms, and diagnosis \(Beyond the Basics\)](#)".)

Stopping smoking may also reduce the risk of other cancers, such as cancers of the head and neck, esophagus,

pancreas, and bladder. Stopping smoking is beneficial even after one of these cancers is diagnosed, since it reduces the risk of getting a second cancer and may improve the chance of survival from the first cancer.

**Peptic ulcer disease** — Cigarette smoking increases the risk of developing peptic ulcer disease. Smoking cessation decreases that risk and increases the rate of ulcer healing, if ulcers have developed. (See "[Patient information: Peptic ulcer disease \(Beyond the Basics\)](#)".)

**Osteoporosis** — Smoking increases bone loss and increases the risk of hip fracture in women. Stopping smoking begins to reverse this risk after about 10 years. Increased bone loss has also been noted in male smokers, although it is not clear how much a man's risk of fracture is increased by smoking. (See "[Patient information: Bone density testing \(Beyond the Basics\)](#)".)

**Other diseases** — Smoking also causes or worsens many other conditions. As an example, pregnant women who smoke have an increased risk of birth defects and of having an underweight baby. Smoking causes premature skin wrinkling and increases the risk of sexual problems (eg, impotence). Stopping smoking probably reduces the risk of these conditions.

**RISKS OF QUITTING SMOKING** — Generally, any risks of smoking cessation are far outweighed by the benefits. Nevertheless, it is reasonable to prepare for the discomforts of stopping smoking:

- Symptoms of withdrawal are common while attempting to stop smoking. Symptoms generally peak in the first three days and decrease over the next three to four weeks.

Withdrawal symptoms can include difficulty sleeping, irritability, frustration or anger, anxiety, difficulty concentrating, and restlessness. Episodic cravings for cigarettes, which can be intense, may persist for many months. Cravings may be brought on by situations associated with smoking, by stress, or by drinking alcohol. These cravings are a common time for ex-smokers to relapse. The cravings will go away if ignored.

- Some people who stop smoking experience depression; this can be severe enough that it requires counseling or antidepressant medication and it can cause the person to start smoking again.

Depression may also be a side effect of some medications taken to help quit smoking. Symptoms of sleeplessness, irritability, sadness, difficulty concentrating, or other signs of depression should be discussed with a healthcare provider. (See "[Patient information: Depression treatment options for adults \(Beyond the Basics\)](#)".)

- Weight gain can occur while stopping smoking because people tend to eat more after quitting. Typically, people gain two to five pounds in the first two weeks, followed by an additional four to seven pounds over the next four to five months. The average weight gain is 8 to 10 pounds.

An exercise program and eating a reasonable diet can minimize weight gain. The benefits of quitting smoking are much greater than the risk of gaining weight. (See "[Patient information: Exercise \(Beyond the Basics\)](#)".)

**PREPARING TO QUIT** — Smoking is recognized as a chronic addictive disease. Smokers, however, can differ markedly in the way in which they smoke. A few may not be addicted to smoking, although it is estimated that 85 percents of smokers in the United States are addicted. Even among those who are addicted, there may be marked differences in success in quitting, symptoms that occur when you try to quit, and factors that may lead to relapse. Discuss any prior attempts to quit with a healthcare provider to improve your chances of successfully quitting.

After deciding to quit smoking, the first step is usually to set a quit date. This is the day when you will completely quit smoking. Ideally, this date should be in the next two weeks, although choosing a special date (eg, birthday, anniversary, or holiday) is another option.

Some people switch to a brand of cigarettes that is lower in tar and nicotine before quitting, but this frequently causes the person to inhale more often or more deeply; low tar and low nicotine cigarettes have no known benefits and are not recommended. Reducing the number of cigarettes smoked prior to the quit date is recommended by some as a means of preparation.

Other steps that may help in preparing to quit include the following:

- Tell family, friends, and coworkers about the plan to quit and ask for their support.
- Avoid smoking in the home and car and other places where you spend a lot of time.
- Review other quit attempts. What worked? What did not work? What contributed to relapse?
- Prepare to deal with nicotine withdrawal symptoms, including anxiety, frustration, depression, and intense cravings to smoke. Recalling previous quit attempts may help anticipate these symptoms. Withdrawal symptoms usually become manageable within a few weeks of stopping completely.
- Prepare to deal with things that trigger smoking. Examples include having smokers in the household or workplace, stressful situations, and drinking alcohol. A vacation from work may be an easier time to quit, particularly if you smoke during work breaks.
- Talk with a healthcare provider about ways to quit smoking. Changing behaviors and taking a medication are the two main methods of quitting smoking. You are more likely to quit if you use both methods together.

**BEHAVIORAL CHANGES TO HELP YOU QUIT** — You can make changes in your behavior to help you quit smoking on your own or you can participate in individual or group sessions. Using behavioral changes with a medication increases your chances of success. (See ['Medications for quitting'](#) below.)

**Problem solving/skills training** — When preparing to quit, it is important to identify situations or activities that increase your risk of smoking or relapse. After identifying these situations, you may need to develop new coping skills. This may include one or more of the following:

- Make lifestyle changes to reduce stress and improve quality of life, such as starting an exercise program or learning relaxation techniques. Vigorous exercise can enhance the ability to stop smoking and avoid relapse and also helps to minimize or avoid weight gain.
- Minimize time with smokers. People who live with smokers can consider negotiating with them to stop smoking at home or in the car.
- Recognize that cravings frequently lead to relapse. Cravings can be prevented to some degree by avoiding situations associated with smoking, by minimizing stress, and by avoiding alcohol. Cravings will subside. Keep oral substitutes (such as sugarless gum, carrots, sunflower seeds, etc.) handy for when cravings develop.
- Avoid thoughts like "having one cigarette will not hurt"; one cigarette typically leads to many more.
- Have as much information as possible about what to expect during a quit attempt and how to cope during this time. Self-help materials such as pamphlets, booklets, videos, or audio tapes; information from a healthcare provider; a counselor; a telephone hotline; the internet; and support groups can be helpful. Some medical centers have patient resources or learning centers with self-help materials. (See ['Where to get more information'](#) below.)

**Support** — Support can be very helpful in quitting smoking and staying off cigarettes. Support can come from family and friends, a healthcare provider, a counselor, a telephone hotline (in the US, 1-800-QUIT-NOW), or support groups. In addition to getting encouragement, it is important to have someone to discuss any problems that develop while trying to quit, such as depression, weight gain, lack of support from family and friends, or prolonged withdrawal symptoms.

**Group counseling** — Group programs are offered by a number of organizations. They typically include lectures, group meeting, a tapering method leading to a "quit day," development of coping skills, and suggestions for preventing relapse. The cost can vary from nothing to several hundred dollars.

**Hypnosis and acupuncture** — Hypnosis and acupuncture are popular stop-smoking methods. Although scientific support for these two methods is weak, some people who have failed with other techniques feel these treatments were helpful.

**MEDICATIONS FOR QUITTING** — There are several medications that may help you stop smoking; in the United States, some of these are available without a prescription while others require a prescription. One of the most effective treatments is [varenicline](#) (brand name: Chantix), a prescription medication. Other options include nicotine replacement therapy and [bupropion](#) (brand names: Zyban, Wellbutrin). Any of these medications can have side effects.

**Nicotine replacement therapy** — Without nicotine, most people develop withdrawal symptoms. These include depression, difficulty falling or staying asleep, irritability, frustration, anger, anxiety, difficulty concentrating, restlessness, and nicotine craving.

Nicotine replacement therapy is designed to reduce the intensity of these symptoms, but will not prevent symptoms completely. Many smokers are able to quit without using nicotine replacement therapy, although nicotine is available to virtually anyone who desires it.

Nicotine replacement therapy appears to be safe, even in people with known heart disease. However, using nicotine replacement along with smoking is **not recommended**.

Nicotine is available in several forms: as a gum or lozenge, patch, nasal spray, or inhaler. None of these forms is significantly superior to another, and all appear similarly effective [2]. However, individual smokers may find one form particularly effective. Combinations of these therapies (usually a patch plus gum, lozenges, nasal spray, or inhaler) are probably more effective than use of one form alone.

**Gum** — Nicotine gum contains nicotine that is slowly released with chewing. Gum is available in 2 mg and 4 mg pieces.

People who smoke 25 cigarettes per day or less can use 2 mg of nicotine gum when needed. Smokers who smoke more than 25 cigarettes per day can use the 4 mg dose; this produces blood levels of nicotine 40 percent lower than smoking. Withdrawal symptoms are not prevented by gum use, but the intensity of the symptoms may be reduced. However, smokers can become chronic gum users.

When used with an intensive behavioral program, nicotine gum can double your chances of quitting. Without a behavioral program, quit rates with gum are usually lower. Gum use is generally recommended for three to six months.

There are disadvantages of using nicotine gum. Some people have a low oral pH (acidity) that reduces the absorption of nicotine. To be effective, the nicotine must be absorbed through the cheek or gums rather than swallowed. Swallowed nicotine can cause stomach upset and is not very effective for treating nicotine withdrawal.

**Lozenges** — Nicotine lozenges slowly release nicotine into the saliva in the mouth. The nicotine works similarly to the gum, as it must be absorbed in the mouth and not swallowed. Because the lozenges do not require chewing, they may be easier for some people to use.

**Skin patches** — Nicotine patches deliver nicotine to the blood through a skin patch. Several doses are available. The highest dose patch (21 to 22 mg/patch) delivers nicotine at a rate about half as high as that of a thirty cigarette per day smoker. Withdrawal symptoms are reduced in intensity, but not eliminated.

The combination of an intensive behavioral program and nicotine patches can double your chances of quitting.

Treatment with nicotine patches is generally recommended at "full dose" for four to six weeks. Some brands of patches include a tapering period of several additional weeks. Longer use of nicotine patches does not generally improve the chance of quitting.

Use of nicotine at night may interfere with sleep, causing vivid dreams. On the other hand, use of nicotine patches at night increases morning blood nicotine levels, which may help prevent difficult early morning withdrawal symptoms. There is a low risk of addiction with nicotine patches.

**Nasal spray** — Nicotine nasal spray delivers a liquid solution of nicotine to the nose. Compared to the patch and gum, the nasal spray produces a relatively rapid rise in nicotine levels in the blood, similar to what happens when you smoke. However, nasal irritation is common, occurring in 94 percent of people during the first two days of use and continuing in many after three weeks of treatment. Nasal sprays are safe. However, sprays can prolong nicotine addiction more than other forms of nicotine replacement.

**Inhaler** — The nicotine inhaler is made up of a mouthpiece and a plastic cartridge that contains nicotine. Nicotine is released when you inhale through the device. Because most of the nicotine is deposited in the mouth, nicotine is absorbed slowly, which may make it less effective for treating cravings.

Irritation of the mouth or throat is common, particularly in the beginning. People with asthma or chronic cough may not be able to use the inhaler due to throat irritation.

Nicotine inhalers are available by prescription in the United States, but are one of the most expensive types of nicotine replacement.

**Combinations of nicotine replacement** — Using a combination of two nicotine replacement products may be more effective than using one form alone. However, use of these combinations should be supervised by a knowledgeable healthcare provider.

Examples of combination treatment include a nicotine patch, which may be worn to provide a constant low level of nicotine, and nicotine gum, which may be used as needed for cigarette cravings.

**Varenicline** — [Varenicline](#) (brand name: Chantix) is a prescription medication that works in the brain to reduce nicotine withdrawal symptoms and cigarette cravings. In several studies, it was more effective than both [bupropion](#) and placebo (a look-alike substitute that contains no medication) [3-5].

It should be taken after eating with a full glass of water as follows:

- One 0.5 mg tablet daily for three days
- One 0.5 mg tablet twice daily for the next four days
- One 1.0 mg tablet twice daily starting at day seven

You should try to quit smoking one week after starting [varenicline](#). You should continue it for 12 weeks before determining if it is working; if you successfully quit at 12 weeks, you may continue taking it for an additional 12 weeks. If you have not quit after taking varenicline for 12 weeks, talk to your healthcare provider about the next step. Options include working harder to make behavioral changes and continuing varenicline or switching to another treatment.

Common side effects of [varenicline](#) include nausea and abnormal dreams.

In 2007, the US Food and Drug Administration (FDA) informed healthcare providers of a small number of people who developed suicidal thoughts and aggressive and erratic behavior during treatment with [varenicline](#) [6]. Although some of these thoughts and behaviors may have been due to quitting smoking rather than varenicline, the report states that not all such patients had discontinued smoking. If you develop agitation, depression, unusual behavior changes, or thoughts of suicide, you should stop varenicline and call your healthcare provider. Similarly, if you have a past history of mood or

behavior problems, discuss this with your healthcare provider before taking varenicline.

In 2011, the FDA issued an advisory that, in people who already have heart or blood vessel disease, [varenicline](#) may increase the risk of acute heart problems [7]. If there is such a risk, it appears to be small, and is likely outweighed by the benefits of quitting smoking.

**Bupropion** — [Bupropion](#) (brand names: Zyban, Wellbutrin) is an antidepressant that can be used to help you stop smoking. It is usually taken once daily for three days, then increased to twice daily starting two weeks before the quit date; it is typically continued for 7 to 12 weeks. Bupropion may be more effective than nicotine replacement therapy, and combining the two may be even more effective.

[Bupropion](#) is generally well tolerated, but it may cause dry mouth and difficulty sleeping. The drug is not recommended for those who have a seizure disorder, head trauma, anorexia nervosa, or bulimia, or who drink alcohol excessively.

Similar to [varenicline](#), if you develop agitation, depression, unusual behavior changes, or thoughts of suicide, you should stop [bupropion](#) and call your healthcare provider. If you have a past history of mood or behavior problems, discuss this with your healthcare provider before taking bupropion.

**RELAPSE** — Most smokers make many attempts to quit before they are able to quit completely. Smoking is a "relapsing" condition, and relapse should not be thought of as failures. Each quit should be regarded a victory, and the longer it lasts, the better.

However, if relapse occurs, it is important to understand why so that your next attempt will be more successful. Keep this in mind when attempting to quit for the first time. If you have success for a while, you can learn what helped and what did not and try again. Try to figure out the reasons that led to start smoking again, and determine if you used the methods (medication, counseling) correctly. Then explore solutions to use next time. Consider trying different methods or combinations of methods.

Most relapses occur in the first week after quitting, when withdrawal symptoms are strongest. Try to mobilize support resources (eg, family, friends) during this critical time. Consider rewards for not smoking; use the money saved on cigarettes for a special treat such as a massage, a movie, a new outfit, or a special dinner.

Later relapses often occur during stressful situations or with social situations that are associated with smoking, often combined with drinking alcohol. Being aware of these high-risk situations may help.

If other problems, such as depression or alcohol or drug dependency, make it more difficult to quit, consider getting professional help from a healthcare provider or counselor. (See "[Patient information: Depression treatment options for adults \(Beyond the Basics\)](#)".)

**ELECTRONIC CIGARETTES** — Electronic cigarettes, also called e-cigarettes, are devices that put nicotine into a vapor that you can breathe in. This vapor has fewer toxins than the smoke you would get from a cigarette, but that doesn't mean that e-cigarettes are toxin-free. In fact, according to the US Food and Drug Administration (FDA), cancer causing agents have been found in e-cigarettes, and nicotine has been found even in "light" e-cigarettes that claim to be nicotine-free.

Some e-cigarettes have been shown to reduce the desire to smoke traditional cigarettes, so people sometimes wonder about using them as a smoking cessation aid. Unfortunately, e-cigarettes are not well regulated, so their constituents vary greatly from product to product. They also have not been studied enough to know whether they are a safe and reasonable alternative to other nicotine delivery tools (such as patches or gum).

**WHERE DO I START?** — The following steps are recommended to start the process of quitting smoking:

- Talk to your healthcare provider about the method you plan to use to quit. Behavior changes should usually be

combined with one or more medications (eg, [varenicline](#), nicotine replacement therapy, or [bupropion](#)).

- Pick a date to quit smoking. Tell friends and family about your plan.
- Seek support through free telephone quitlines (eg, in the US, 1-800-QUIT-NOW)
- Begin making changes in your behavior — avoid situations that lead you to smoke.
- Start [varenicline](#) or [bupropion](#) one week before your quit date or start nicotine replacement on the day you quit.
- Deal with withdrawal symptoms as they develop. Consider using nicotine replacement therapy (such as nicotine patch, gum, or lozenge) to help manage withdrawal symptoms. Do not "smoke just one" to get through a rough day. Consult support groups for more tips on coping with withdrawal.

**WHERE TO GET MORE INFORMATION** — Your healthcare provider is the best source of information for questions and concerns related to your medical problem.

This article will be updated as needed on our web site ([www.uptodate.com/patients](http://www.uptodate.com/patients)). Related topics for patients, as well as selected articles written for healthcare professionals, are also available. Some of the most relevant are listed below.

**Patient level information** — UpToDate offers two types of patient education materials.

**The Basics** — The Basics patient education pieces answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials.

[Patient information: Quitting smoking \(The Basics\)](#)

[Patient information: Lung cancer \(The Basics\)](#)

[Patient information: Lung cancer screening \(The Basics\)](#)

[Patient information: Non-small cell lung cancer \(The Basics\)](#)

[Patient information: Small cell lung cancer \(The Basics\)](#)

[Patient information: Ankylosing spondylitis \(The Basics\)](#)

[Patient information: How to plan and prepare for a healthy pregnancy \(The Basics\)](#)

[Patient information: Recovery after coronary artery bypass graft surgery \(CABG\) \(The Basics\)](#)

[Patient information: Schizophrenia \(The Basics\)](#)

[Patient information: Heart attack recovery \(The Basics\)](#)

[Patient information: Cough in adults \(The Basics\)](#)

[Patient information: Common wrist injuries \(The Basics\)](#)

[Patient information: Finger fracture \(The Basics\)](#)

[Patient information: Clavicle fracture \(The Basics\)](#)

[Patient information: Hip fracture \(The Basics\)](#)

[Patient information: Rib fractures in adults \(The Basics\)](#)

[Patient information: Shinbone fracture \(The Basics\)](#)

[Patient information: Vertebral compression fracture \(The Basics\)](#)

[Patient information: Ankle fracture \(The Basics\)](#)

[Patient information: Boxer's fracture \(The Basics\)](#)

[Patient information: Toe fracture \(The Basics\)](#)

[Patient information: Pelvic fracture \(The Basics\)](#)

[Patient information: Neck fracture \(The Basics\)](#)

[Patient information: Coronary heart disease in women \(The Basics\)](#)

[Patient information: Secondhand smoke: Risks to children \(The Basics\)](#)

**Beyond the Basics** — Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are best for patients who want in-depth information and are comfortable with some medical jargon.

[Patient information: Chronic obstructive pulmonary disease \(COPD\), including emphysema \(Beyond the Basics\)](#)

[Patient information: Lung cancer risks, symptoms, and diagnosis \(Beyond the Basics\)](#)

[Patient information: Peptic ulcer disease \(Beyond the Basics\)](#)

[Patient information: Bone density testing \(Beyond the Basics\)](#)

[Patient information: Depression treatment options for adults \(Beyond the Basics\)](#)

[Patient information: Exercise \(Beyond the Basics\)](#)

**Professional level information** — Professional level articles are designed to keep doctors and other health professionals up-to-date on the latest medical findings. These articles are thorough, long, and complex, and they contain multiple references to the research on which they are based. Professional level articles are best for people who are comfortable with a lot of medical terminology and who want to read the same materials their doctors are reading.

[Cardiovascular risk of smoking and benefits of smoking cessation](#)

[Cigarette smoking and other risk factors for lung cancer](#)

[Cigarette smoking and pregnancy](#)

[Behavioral approaches to smoking cessation](#)

[Strategies to reduce postoperative pulmonary complications](#)

[Overview of smoking cessation management in adults](#)

[E-cigarettes](#)

The following organizations also provide reliable health information.

- National Library of Medicine

[www.nlm.nih.gov/medlineplus/healthtopics.html](http://www.nlm.nih.gov/medlineplus/healthtopics.html)

- National Heart, Lung and Blood Institute

[www.nhlbi.nih.gov/](http://www.nhlbi.nih.gov/)

- American Lung Association

[www.lungusa.org/](http://www.lungusa.org/)

- American Heart Association

[www.americanheart.org](http://www.americanheart.org)

- QuitNet

[www.quitnet.com](http://www.quitnet.com)

- Massachusetts Department of Public Health

[www.makesmokinghistory.org/](http://www.makesmokinghistory.org/)

- Agency for Health Care Research and Quality

[www.ahrq.gov/consumer/tobacco/](http://www.ahrq.gov/consumer/tobacco/)

[1-6]

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Topic 2729 Version 26.0

## Disclosures

### Disclosures

**Disclosures:** **Joyce A Sackey, MD, FACP** Nothing to disclose. **Stephen I Rennard, MD** Speaker's Bureau: Forest (acridinium bromide, roflumilast); CME Incite; Novis; PriMed; Takeda (roflumilast). Consultant/Advisory Boards: Almirall (acridinium bromide); Nycomed; Pfizer (varenicline); A2B Bio; Daiichi Sankyo; APT Pharma/Britnall; AstraZeneca (budesonide/formoterol fumarate dihydrate); Boehringer Ingelheim [COPD(tiotropium bromide; olodaterol)]; Chiesi; Decision Resource; Dunn Group; Easton Associates; Gerson; GlaxoSmithKline (fluticasone and vilanterol, fluticasone/salmeterol); Roche; Theravance; CSL Behring; MedImmune; Novartis (indacaterol); Pearl; Takeda (roflumilast). **James K Stoller, MD, MS** Consultant/Advisory Boards: CSL Behring [Alpha-1 antitrypsin deficiency (Augmentation therapy (IV alpha-1 antiprotease))]; Kamada [Alpha-1 antitrypsin deficiency (Augmentation therapy (IV alpha-1 antiprotease))]; Baxter [Alpha-1 antitrypsin deficiency (Augmentation therapy (IV alpha-1 antiprotease))]; Grifols [Alpha-1 antitrypsin deficiency (Augmentation therapy (IV alpha-1 antiprotease))]; Boehringer Ingelheim [COPD (Bronchodilators (various))]. **Robert H Fletcher, MD, MSc** Nothing to disclose. **Lee Park, MD** Employee of UpToDate, Inc. Employment (Spouse): Novartis [Age-related macular degeneration (ranibizumab)].

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