

Nicotine Dependence

A plain-English guide for you and your family

WHAT IS HAPPENING

When you first smoke, nicotine travels to your brain in seconds and plugs into tiny docking sites called nicotinic receptors. These receptors sit on nerve cells in the reward center deep in your brain. When nicotine locks in, those cells release dopamine, a chemical messenger that makes you feel alert, calm, and satisfied all at once. Your brain remembers that feeling and wants it again. After weeks or months of smoking, your brain grows extra nicotinic receptors to handle all the incoming nicotine, and it starts to expect nicotine just to feel normal. If you stop smoking, those extra receptors sit empty and your dopamine drops, so you feel irritable, anxious, restless, and hungry. You crave another cigarette because your brain has learned that smoking is the fastest way to refill the dopamine tank. This is dependence: your brain chemistry has changed so that nicotine feels required, not optional. The good news is that medication (varenicline or bupropion plus nicotine replacement) can quietly fill some of those receptors or boost dopamine while you retrain your habits, and counseling teaches you new ways to handle triggers so your brain can slowly return to balance without cigarettes.

What you might feel

- Strong urge or craving to smoke, especially first thing in the morning
- Smoking within 30 minutes of waking up
- Smoking more cigarettes per day than you plan to, or unable to cut down
- Irritability, restlessness, or anger when you try to quit or cut back
- Trouble concentrating or brain fog during a quit attempt
- Increased appetite or weight gain after quitting
- Continuing to smoke despite knowing it harms your health (e.g. after a heart attack or COPD diagnosis)
- Smoking when you are sick or have a cough that won't go away

Call the doctor right away if...

- Chest pain, shortness of breath, or coughing up blood (may signal heart disease, COPD, or lung cancer from smoking)
- New confusion, slurred speech, or one-sided weakness (may be a stroke, which smoking greatly raises the risk for)
- Severe depression or thoughts of suicide during a quit attempt (nicotine withdrawal can unmask or worsen mood disorders)
- Pregnant and still smoking (nicotine crosses the placenta and harms the baby's brain and lungs; quitting now is urgent)

What the care team will do

- Screen for chest pain, shortness of breath, or coughing up blood and escalate immediately if present
- Assess suicide risk and depression symptoms before starting quit medications and weekly during the first month
- Set a firm quit date within 1 to 2 weeks and start varenicline or bupropion 1 week before that date
- Teach proper use of combination nicotine replacement: apply one 21 mg patch each morning PLUS use 4 mg gum or lozenge every 1 to 2 hours when cravings hit
- Refer to behavioral counseling (telephone quitline 1-800-QUIT-NOW or in-person sessions) and schedule the first session before quit date
- Warn about seizure risk with bupropion and tell patient to stop the medicine and call immediately if they have shaking, loss of consciousness, or convulsions
- Monitor blood pressure weekly for the first month in patients taking varenicline
- Schedule a follow-up visit or phone call 3 days after quit date, then weekly for the first month

Medicines you may be given — and why

Varenicline (Chantix)

Varenicline attaches to the same spot in your brain that nicotine normally locks onto—the nicotinic acetylcholine receptor (the switch that lights up your brain's reward center when you smoke). It sits on that switch and gives a gentle, steady push—just enough to quiet your cravings and ease the jumpiness you feel when you quit—but not enough to give you the big hit you got from cigarettes. At the same time, it blocks nicotine from getting through, so if you do smoke, you don't feel much reward. This makes it easier to break the habit loop.

Nicotine Replacement Therapy (NRT): Patch

The nicotine patch releases a slow, steady stream of nicotine through your skin all day long. This keeps a low, even level of nicotine in your blood—just enough to quiet the fierce cravings and the jittery, angry feelings that hit when you stop smoking, but without the quick spike and crash you get from a cigarette. It gives your brain the chemical it's used to, so you can focus on breaking the hand-to-mouth habit and the situations that made you light up, without fighting withdrawal at the same time.

Nicotine Replacement Therapy (NRT): Gum or Lozenge

Nicotine gum and lozenges release nicotine quickly through the lining of your mouth into your bloodstream. They work faster than a patch—within a few minutes—so you can use them the moment a craving hits. This quick boost calms the urge and takes the edge off withdrawal symptoms like irritability, trouble focusing, and the nagging pull to smoke. They give you control: you use them when you need them, not on a fixed schedule.

Combination NRT (Patch + Gum or Lozenge)

Using a nicotine patch and gum (or lozenge) together gives you the best of both: the patch delivers a steady background level of nicotine all day to keep withdrawal at bay, while the gum or lozenge gives you a quick boost when a sudden craving hits. This two-layer approach covers both the constant low hum of withdrawal and the sharp spikes of craving that come with triggers—like seeing someone else smoke, feeling stressed, or finishing a meal. Studies show this combination works better than either one alone.

Bupropion SR (Zyban, Wellbutrin SR)

Bupropion was first used to treat depression, but doctors noticed it also helped people quit smoking—even if they weren't depressed. It works by blocking the brain's cleanup crew that normally sweeps up norepinephrine (a chemical that keeps you alert and steady) and dopamine (the feel-good messenger). When those chemicals hang around longer in the spaces between brain cells, cravings ease, your mood stays more even, and the restless, irritable feelings of withdrawal fade. It also seems to weaken the nicotine reward circuit, so smoking feels less satisfying if you slip.

Where this information comes from

- USPSTF 2021 Tobacco Smoking Cessation recommendation
- AHA/ACC 2018 Guideline on the Management of Blood Cholesterol (tobacco cessation)
- CDC Tips From Former Smokers and smoking cessation resources
- Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), Tobacco Use Disorder

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