



# HOW SMOKING AFFECTS HEALING

## HOW DOES SMOKING AFFECT HEALING AFTER SURGERY?

If you're a smoker thinking about having surgery on your foot or ankle, there are some important things you should know. Cigarette smoke is filled with harmful chemicals including nicotine, hydrogen cyanide, and carbon monoxide. Smoking increases the chance that after surgery your bones and tissue may not heal well, the area may become infected, and you may have more pain.

### **Your body gets less oxygen.**

The air we breathe is filled with oxygen, which is needed for most functions in the body, including healing after surgery. On a microscopic level, chemicals found in cigarette smoke cause many changes to the way the body handles oxygen. Hemoglobin, a molecule that carries oxygen throughout the body, cannot carry as much oxygen as usual when it is exposed to cigarette smoke. Tiny blood vessels in the body become narrow, which makes it more difficult for hemoglobin and oxygen to get to the areas where they are needed.

### **Your blood doesn't flow as easily.**

Smoking makes blood thicker so it doesn't flow as easily through narrowed blood vessels. Think about a busy four-lane highway filled with big trucks hauling precious cargo. If this were the body, smoking would have the effect of shutting the highway down to two lanes and pouring

sticky tar on the road. It would be much more difficult for cargo to get where it needed to go. In the same way, areas of the body that need oxygen (like your foot) cannot get it. With less oxygen, the body has a more difficult time healing the skin where the surgery is performed.

## **Your bones may not heal.**

If surgery involves the bones of the foot or ankle, smoking may prevent the bones from healing, which is called a nonunion. Current research shows that smokers may have anywhere from 2-10 times the risk of wound problems and/or nonunion after surgery.

## **Your body has trouble fighting infections.**

Smoking also has been shown to make it more difficult for your body to fight off an infection after surgery. Chemicals in cigarette smoke limit the activity of infection-fighting cells called neutrophils. Neutrophils are "bodyguard" cells in the body. They restore a safe environment by getting rid of things that don't belong, like bacteria, before problems are caused. Without normal neutrophils, an infection could set in that may require antibiotics or even more surgery to cure. Smokers have been shown to have **up to four times the risk of infection** after foot surgery than nonsmokers.

## **You experience more pain after surgery.**

Recent research shows that some smokers may have more pain after surgery than nonsmokers. Chemicals in cigarette smoke may increase inflammation and affect the way the body interprets pain signals. Combined, this may increase the amount of pain experienced by smokers, which may persist long after the wound has healed.

## **Are these effects permanent?**

The good news is that research in other areas of the body shows that if you quit smoking before surgery your risk of complications goes down! Even if you can stop smoking for 4-6 weeks before your surgery and while your body is healing afterward, you significantly lower the chance of having a problem. Sometimes you may not be able to wait six weeks to have a surgery, like with an ankle fracture. Research has shown that smokers who don't smoke after their fracture surgery have fewer complications than those that continue to smoke.

## How can I quit smoking?

First, it's important to recognize that you are not alone in the struggle to stop smoking and there are many resources available to help you. Call 1-800-QUIT-NOW or go to [smokefree.gov](https://www.smokefree.gov) to find online resources and help to develop a quit plan. If you live outside the United States, check online for local resources to help you stop smoking, or talk with your primary doctor.

Studies have shown that working with a counselor increases your success rate three times that of trying to quit cold turkey. Your [foot and ankle orthopaedic surgeon](#) may also work with your primary care physician to suggest medications that may increase your ability to quit smoking.

Remember, although smoking increases the risk of a problem happening after surgery, it is a risk factor that you have the power to change. Give yourself the best chance of having a great outcome after your foot or ankle surgery by talking to your surgeon and using resources to get started.

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