

STAYING HEALTHY

Smoking and Musculoskeletal Health

Smoking remains the number one cause of preventable death in the United States. According to the Centers for Disease Control and Prevention (CDC), each year more than 480,000 people in the U.S. alone die from tobacco-related diseases. In fact, smokers can expect to live 7 to 10 years less than nonsmokers.

It is commonly known that smoking is linked to heart and respiratory diseases and to several cancers. Many people are not aware, however, that smoking also has a serious negative effect on your bones and joints.

Effects of Smoking on Musculoskeletal Health

Every tissue in the human body is affected by smoking, but many effects are reversible. By avoiding or quitting smoking, you can reduce your risk for incurring many conditions. Quitting smoking can also help your body regain some of its normal healthy functioning.

Here's what scientists have found about the relationship between smoking and musculoskeletal health.

- Smoking increases your risk of developing [osteoporosis \(/en/diseases--conditions/osteoporosis/\)](#) – a weakness of bone that causes fractures. Elderly smokers are 30% to 40% more likely to [break their hips \(/en/diseases--conditions/hip-fractures/\)](#) than their non-smoking counterparts. Smoking weakens bones in several ways, including:
 - Studies have shown that smoking reduces the blood supply to bones, just as it does to many other body tissues.
 - The nicotine in cigarettes slows the production of bone-forming cells (osteoblasts) so that they make less bone.
 - Smoking decreases the absorption of calcium from the diet. [Calcium \(/en/staying-healthy/calcium-nutrition-and-bone-health/\)](#) is necessary for bone

mineralization, and with less bone mineral, smokers develop fragile bones (osteoporosis).

- Smoking seems to break down estrogen in the body more quickly. Estrogen is important to build and maintain a strong skeleton in women and men.
- Smoking also effects the other tissues that make up the musculoskeletal system, increasing the risk of injury and disease:
 - [Rotator cuff \(shoulder\) tears](/en/diseases--conditions/rotator-cuff-tears/) in smokers are nearly twice as large as those in nonsmokers, which is probably related to the quality of these tendons in smokers.
 - Smokers are 1.5 times more likely to suffer overuse injuries, such as bursitis or tendinitis, than nonsmokers.
 - Smokers are also more likely to suffer traumatic injuries, such as sprains or [fractures](/en/diseases--conditions/fractures-broken-bones/).
 - Smoking is also associated with a higher risk of [low back pain](/en/diseases--conditions/low-back-pain/) and [rheumatoid arthritis](/en/diseases--conditions/rheumatoid-arthritis/).
- Smoking has a detrimental effect on fracture and wound healing:
 - Fractures take longer to heal in smokers because of the harmful effects of nicotine on the production of bone-forming cells.
 - Smokers also have a higher rate of complications after surgery than nonsmokers — such as poor wound healing and infection — and outcomes are less satisfactory. This is related to the decrease in blood supply to the tissues.
- Smoking has a detrimental effect on athletic performance:
 - Because smoking slows lung growth and impairs lung function, there is less oxygen available for muscles used in sports. Smokers suffer from shortness of breath almost three times more often than nonsmokers. Smokers cannot run or walk as fast or as far as nonsmokers.
- Smoking can make you too thin and put you at greater risk for fractures. Nicotine signals the brain to eat less and can prevent the body from getting adequate nutrition. Having a body weight that is close to ideal for your height and age is important for general health.

Does Vaping Affect Bone Health?

It is not just cigarette smoking that appears to be bad for bones: Studies suggest that e-cigarettes, or vaping, can also negatively impact musculoskeletal health.

- A November 2021 study found that people who vape had a 46% higher rate of fractures than people who did not vape. The findings were published in the *American Journal of Medicine Open*.
- That same study also reported that people who both smoke cigarettes *and* vape have a higher risk of fractures than people who only smoke cigarettes.
- A 2020 study looking at the effects of vaping on intervertebral disk health, bone health, and [spinal fusion\(/en/treatment/spinal-fusion/\)](#) reported that the carcinogens (substances that can cause cancer) in e-cigarettes are associated with increases of oxidative stress and inflammation in the body. Oxidative stress means there are so many free radicals (unstable oxygen molecules) in the body that the body's antioxidants cannot get rid of them. Oxidative stress and inflammation can damage bones and possibly raise the risk of osteoporosis.

While further research about the effects of vaping on bone health are needed, it is important to note that like cigarette smoking, vaping is not harmless and appears to impact many different systems in the body — including the musculoskeletal system.

Last Reviewed

September 2021

Peer-Reviewed by

[Thomas Ward Throckmorton, MD, FAAOS](#)

AAOS does not endorse any treatments, procedures, products, or physicians referenced herein. This information is provided as an educational service and is not intended to serve as medical advice. Anyone seeking specific orthopaedic advice or assistance should consult his or her orthopaedic surgeon, or locate one in your area through the AAOS [Find an Orthopaedist](#) program on this website.