



**National Institutes of Health
Osteoporosis and Related
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Smoking and Bone Health

Many of the health problems caused by tobacco use are well known. Cigarette smoking causes heart disease, lung and esophageal cancer, and chronic lung disease. Additionally, several research studies have identified smoking as a risk factor for osteoporosis and bone fracture. The Centers for Disease Control and Prevention estimates that smoking-related illnesses cost Americans more than \$193 billion each year in lost productivity and health care expenditures.

Facts About Osteoporosis

Osteoporosis is a condition in which bones weaken and are more likely to fracture. Fractures from osteoporosis can result in pain and disability. Osteoporosis is a major health threat for an estimated 44 million Americans, 68 percent of whom are women.

In addition to smoking, risk factors for developing osteoporosis include:

- thinness or small frame
- family history of the disease
- being postmenopausal and particularly having had early menopause
- abnormal absence of menstrual periods (amenorrhea)
- prolonged use of certain medications, such as those used to treat lupus, asthma, thyroid deficiencies, and seizures
- low calcium intake
- lack of physical activity
- excessive alcohol intake.

Osteoporosis can often be prevented. It is known as a "silent" disease because, if undetected, bone loss can progress for many years without symptoms until a fracture

occurs. It has been called a childhood disease with old age consequences because building healthy bones in youth helps prevent osteoporosis and fractures later in life. However, it is never too late to adopt new habits for healthy bones.

Smoking and Osteoporosis

Cigarette smoking was first identified as a risk factor for osteoporosis more than 20 years ago. Recent studies have shown a direct relationship between tobacco use and decreased bone density. Analyzing the impact of cigarette smoking on bone health is complicated. It is hard to determine whether a decrease in bone density is due to smoking itself or to other risk factors common among smokers. For example, in many cases smokers are thinner than nonsmokers, tend to drink more alcohol, may be less physically active, and have poor diets. Women who smoke also tend to have an earlier menopause than nonsmokers. These factors place many smokers at an increased risk for osteoporosis apart from their tobacco use.

In addition, most studies on the effects of smoking suggest that smoking increases the risk of having a fracture. Not all studies support these findings, but the evidence is mounting. For example:

- The longer you smoke and the more cigarettes you consume, the greater your risk of fracture in old age.
- Smokers who fracture may take longer to heal than nonsmokers and may experience more complications during the healing process.
- Significant bone loss has been found in older women and men who smoke.
- At least one study suggests that exposure to *secondhand smoke* during youth and early adulthood may increase the risk of developing low bone mass.
- Compared with nonsmokers, women who smoke often produce less estrogen (a sex hormone) and tend to experience menopause earlier, which may lead to increased bone loss.
- Quitting smoking appears to reduce the risk of low bone mass and fractures. However, it may take several years to lower a former smoker's risk.

Osteoporosis Management Strategies

Start by quitting: The best thing smokers can do to protect their bones is to quit smoking. Smoking cessation, even later in life, may help limit smoking-related bone loss. Many resources are available to help you stop smoking, some of which are listed at the end of this fact sheet.

Eat a well-balanced diet rich in calcium and vitamin D: Good sources of calcium include low-fat dairy products; dark green, leafy vegetables; and calcium-fortified foods and beverages. Supplements can help ensure that you get adequate

amounts of calcium each day, especially in people with a proven milk allergy. The Institute of Medicine recommends a daily calcium intake of 1,000 mg (milligrams) for men and women, increasing to 1,200 mg for those age 50 and older.

Vitamin D plays an important role in calcium absorption and bone health. It is synthesized in the skin through exposure to sunlight. Food sources of vitamin D include egg yolks, saltwater fish, and liver. Many people obtain enough vitamin D by getting about 15 minutes of sunlight each day; others, especially those who are older or housebound, may need vitamin D supplements to achieve the recommended intake of 400 to 600 IU (International Units) each day.

Exercise for your bone health: Like muscle, bone is living tissue that responds to exercise by becoming stronger. Weight-bearing exercise that forces you to work against gravity is the best exercise for bone.

Some examples include walking, climbing stairs, weight training, and dancing. Regular exercise, such as walking, may help prevent bone loss and will provide many other health benefits.

Avoid excessive use of alcohol: Chronic alcohol use has been linked to an increase in fractures of the hip, spine, and wrist. Drinking too much alcohol interferes with the balance of calcium in the body. It also affects the production of hormones, which have a protective effect on bone, and of vitamins, which we need to absorb calcium. Excessive alcohol consumption also can lead to more falls and related fractures.

Talk to your doctor about a bone density test: A bone mineral density (BMD) test measures bone density at various sites of the body. This safe and painless test can detect osteoporosis before a fracture occurs and can predict one's chances of fracturing in the future. If you are a current or former smoker, you may want to ask your health care provider whether you are a candidate for a BMD test, which can help determine whether medication should be considered.

See if medication is an option for you: There is no cure for osteoporosis. However, several medications are available to prevent and treat the disease in postmenopausal women and in men. Your doctor can help you decide whether medication might be right for you.

Smoking Cessation Resources

Smokefree.gov: Created by the National Cancer Institute, smokefree.gov is a Web site designed to help you quit smoking. Different people need different resources as they try to quit. The information and professional assistance available on this Web site can help to support both your immediate and long-term needs as you become, and remain, a nonsmoker. Available at www.smokefree.gov.

Pathways to Freedom: Winning the Fight Against Tobacco: Intended for use by African Americans, this guide was produced by the Centers for Disease Control and Prevention in partnership with key segments of the African American community, including churches, service organizations, and educational institutions. The development and revision of this guide was inspired by national concern over the high smoking rates in the African American population and the absence of relevant materials. The guide addresses many issues that are specific to African Americans, such as targeted advertising campaigns and historical, cultural, and socioeconomic influences. This resource offers proven strategies for anyone who wants to quit, information on how friends and family can help, and ideas on how the community and its leaders can promote the value of living a tobacco-free life. Available at www.cdc.gov/tobacco/quit_smoking/how_to_quit/pathways or by calling 800-232-1311 to request a free copy.

A Breath of Fresh Air: Independence from Smoking: Produced by the National Women's Health Information Center, this Internet-based education and support program focuses on smoking cessation for women. Information is also available in Spanish. Available at www.4woman.gov/QuitSmoking.

Kick the Smoking Habit/Rompa con el hábito de fumar: Written especially for Latino families, this booklet is part of a bilingual series from the National Heart, Lung, and Blood Institute that explains steps people can take to reduce their risk of having a heart attack or stroke. Information is provided in a friendly style to help readers dispel some common myths. Available at www.nhlbi.nih.gov/health/public/heart/other/sp_smok.htm or by calling 301-592-8573 or 240-629-3255 (TTY).

For Your Information

This publication contains information about medications used to treat the health condition discussed here. When this fact sheet was printed, we included the most up-to-date (accurate) information available. Occasionally, new information on medication is released.

For updates and for any questions about any medications you are taking, please contact the Food and Drug Administration at 888-INFO-FDA (888-463-6332, a toll-free call) or visit its Web site at www.fda.gov.

For updates and questions about statistics, please contact the Centers for Disease Control and Prevention's National Center for Health Statistics toll free at 800-232-4636 or visit its Web site at www.cdc.gov/nchs.

Recognizing the National Bone and Joint Decade: 2002–2011