

Build Strong Bones

CHALLENGE

Do what you can to protect and strengthen your bones.

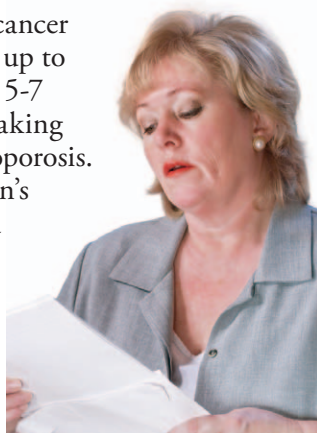
Requirements to Complete this HEALTH CHALLENGE™

1. Keep a written record of how many days you do weight-bearing and weightlifting exercises and how many days you eat meals that are helpful for bone health – primarily plant-based foods that contain adequate calcium, vitamin D, vitamin K, and vitamin B12. Record this on your Health Challenge Calendar.
2. Read “What is osteoporosis,” “Eat right for healthy bones,” and “Exercise.”
3. To complete the Challenge, do bone-strengthening exercises and eat a bone-healthy diet on at least 22 days this month.
4. Keep records of your completed Challenge in case your organization requires documentation.

What is osteoporosis?

Osteoporosis is often referred to as the “silent epidemic.” Bone loss is gradual and painless; in most cases a fracture is the first sign that you have it. By the time you notice you have a stooped back (kyphosis or “dowager’s hump”) or have lost a few centimeters in height, you may have already suffered spinal fractures. That’s why it’s important to know if you have any risk factors for osteoporosis and to do what you can to protect your bones.

The lifetime osteoporotic fracture risk for women is 1 in 3, while breast cancer risk is 1 in 8. Women can lose up to 20% of their bone mass in the 5-7 years following menopause, making them more susceptible to osteoporosis. But osteoporosis isn’t a “woman’s disease.” The lifetime risk for a man over age 50 to experience an osteoporotic fracture is 1 in 5. The lifetime risk of developing prostate cancer is 1 in 6.



Eat right for healthy bones

Over the past few decades, dietary choices have proven to have a big affect on bone mineral density in men and women. Various nutrients in foods increase bone mineral density and improve bone health through the nerves, the muscles, and the remodeling processes of bones themselves.

Calcium

Adequate calcium intake throughout life is necessary for strong bones. Before age 30, eating enough calcium in foods and getting enough physical activity maximize bone health. After age 30, getting enough calcium and physical activity help slow bone loss – but they can’t completely prevent the bone loss that comes with aging. To enhance calcium absorption and bone health, you should also get adequate vitamin D.

Girls who exercise too much and eat too little (e.g., elite competitive athletes or those with anorexia nervosa) can stop having periods during puberty when their maximal bone mass is achieved. This puts these girls at high risk for low bone mass and fractures.

The Harvard School of Public Health lists other factors that might affect the calcium in your body:

- **Drinking a lot of coffee** – 4 or more cups per day – can increase the risk of fracture. Caffeine causes calcium to be excreted in the urine.
- **Getting too much animal protein** can leach calcium from your bones. Animal protein seems to cause more of this calcium leaching than vegetable protein does.
- **Too much vitamin A from animal sources** (called *retinol*) can promote fractures. Vitamin A from plant sources (called *beta-carotene*) does not increase fracture risk.

Where to find calcium: Low-fat milk and other dairy products contain calcium. Calcium is also in dark green leafy vegetables (broccoli, collard greens, kale, spinach, etc.) and beans (black beans, navy beans, soybeans, etc.). You can also buy calcium-fortified ready-to-eat breakfast cereal, orange juice, or soymilk. Calcium supplements increase bone mineral density in postmenopausal women. Calcium and vitamin D supplementation can reduce bone loss and fracture rates in older men and women. In one study, a single intervention with vitamin D plus calcium over a

3-month period reduced a person's risk of falling by 49% when compared with taking calcium alone.

Protein

Preventing osteoporosis is not just about taking in and absorbing enough calcium. It's also about consuming other minerals, vitamins, phytochemicals (chemicals found in plants), and protein. Protein is important in preventing osteoporosis.

The living part of the bone is made up primarily of proteins. You need to eat 2–3 servings of healthy proteins each day. High levels of animal protein may cause calcium loss. Plant-based foods help preserve bone and decrease bone loss.

Eating moderate amounts of animal proteins, such as fish, skinless poultry, and low-fat dairy can be a healthy part of your diet. But plant foods should be the bulk of your diet.

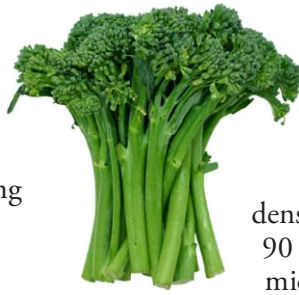
Include a variety of plant-based foods in your daily diet: soybeans (and tofu), lentils, black beans, kidney beans, chickpeas, pinto beans, peas, black-eyed peas, spinach and other greens, whole grains, nuts, seeds (especially sunflower seeds), and lots of fresh vegetables and fruit.

Vitamin D

Bones are made of minerals and protein, but any deficiency of vitamin D impairs the normal mineralizing of new bone. Vitamin D is essential to help your body absorb calcium and deposit calcium in bones. Vitamin D is also beneficial to muscle strength and balance.

For good bone health, spend time outdoors in the sunshine whenever possible. Many people are not getting adequate vitamin D for good health, especially those who live in northern regions. If your time in the sun is limited, be sure you get adequate vitamin D in your diet (e.g., vitamin D-fortified milk) or take a supplement if needed (e.g., 1,000 IU vitamin D daily).

For bone health, eat an abundance of whole plant foods, drink an adequate amount of milk or calcium- and D-fortified soy milk, and spend active time outdoors in the sun as often as possible.



Vitamin K

Vitamin K is good for bones. It increases bone mineral density in people with osteoporosis, reduces fracture rates, and functions with vitamin D to increase bone density. The recommended dietary intakes are 90 micrograms per day for women and 120 micrograms per day for men. You can easily meet that requirement by eating a well-balanced diet that includes a variety of green vegetables.

Where to find vitamin K: Vitamin K is found especially in green leafy foods (e.g., broccoli, cabbage, collard greens, green leaf lettuce, kale, spinach, Swiss chard, turnip greens), as well as in olive, soybean, and canola oil. In one study, researchers found the risk of hip fracture was reduced with as little as one serving per day of green leaf lettuce, compared to eating one serving or less a week. Think of how strong your entire skeleton could be if you ate foods with more vitamin K every day!

Vitamin B12

Research shows that folate (a B vitamin) and vitamin B12 also help build stronger bones. In one study, half the people received folate and vitamin B12. The other half received a placebo. Those taking folate and vitamin B12 had an 80% decreased risk of hip fractures, and a 76% decreased risk for all fractures compared to the placebo group.

Where to find vitamin B12: Younger people can usually find adequate B12 in low-fat dairy products, vitamin B12-fortified soy milk and ready-to-eat cereals, eggs, and lean meats. An inadequate blood B12 level is common in the United States in people over age 50 due to poor nutrient absorption. People over the age of 50 should consider taking a vitamin B12 supplement if they are at high risk for osteoporosis.

Natural sources of folate are leafy green vegetables such as spinach and turnip greens; citrus fruits and juices; and dried beans, lentils, and peas.

Osteoporosis and Fractures	
Factors that increase risks	Factors that lower risks
<ul style="list-style-type: none"> • Increasing age, especially after menopause in women • Sedentary life • Being too lean • High blood pressure • High sodium (salt) in the diet • Smoking • Caffeinated beverages • High levels of retinol (vitamin A from animal sources) • Diet high in meat (animal proteins) • Certain medications (long-term steroid use, certain blood thinners or diuretics) • Depression • High alcohol intake 	<ul style="list-style-type: none"> • Weight-bearing exercises • Adequate calcium • Adequate vitamin D • Adequate vitamin B12 • Adequate vitamin K • Diet high in fruits and vegetables and plant proteins • Sunshine daily, or vitamin D supplements • Eating more soy foods may be helpful • Certain medications are available that help improve bone health



Exercise builds strong bones

Exercise, combined with a good diet, makes strong bones and decreases the risk of back fractures and curvature of the spine.

Weightlifting and weight-bearing activities contribute to development of high peak bone mass and muscle mass, and may reduce risk of falls.

Alternatively, inactivity puts a person at risk for weaker bones.

People with a more sedentary lifestyle are more likely to have a hip fracture than those who are more active. Researchers found that women who sit for more than 9 hours a day are 50% more likely to have a hip fracture than those who sit for less than 6 hours a day

What are weight-bearing activities? Any activity that makes you move against gravity while staying upright qualifies as being weight-bearing. High-impact exercises are best for building bones. These include playing basketball, dancing, doing aerobics, hiking, jogging or running, jumping rope, climbing stairs, and playing racquetball.

Low-impact exercises can also help to build bones and are safer for people who cannot do high-impact exercises, such as people with osteoporosis. Some low-impact activities include: walking briskly, using an elliptical or stair-step machine, and doing low-impact aerobics.

According to the International Osteoporosis Foundation, exercise is good for every body:

- In the young, exercise helps build strong bones.
- It helps adults maintain their muscles and bone mass.
- Exercise helps prevent bone loss and falls in the elderly.



Special exercises improve muscle strength and muscle function for greater mobility and improved quality of life in people who have had fractures.

Weight training (with free weights or weight machines) helps maintain or increase bone mineral density. Exercises that improve balance and core strength, such as yoga and tai chi, are also beneficial. Exercises such as swimming do not increase bone density – but they do increase cardiovascular fitness and could be included as part of your regular fitness program.

How much exercise?

In most cases, aim for at least 30 minutes of weight-bearing exercise, such as walking or jogging, at least 3 days a week. Five days a week is even better. On at least 2 days, do strength-building and resistance exercises. The remaining days of the week, you can do non-weight-bearing exercises, such as bicycling or swimming, if you prefer. Activity is good, very good. But balance your activity with adequate nutrition to maintain a healthy weight. Low body weight and weight loss are associated with greater bone loss and with increased risk of fracture for men and women. Eat enough of the right foods to maintain a healthy weight and strong bones.

Learn about other ways to strengthen your bones and prevent osteoporosis:
www.wellsource.info/wn/osteoporosis.pdf

Check Up on Your Bones,
by the National Institutes of Health Osteoporosis and Related Bone Diseases – National Resource Center
www.niams.nih.gov/Health_Info/Bone/Optool/index.asp

Sources:

U.S. Department of Agriculture. 2009.
International Osteoporosis Foundation. 2009.
National Osteoporosis Foundation. 2009.
Harvard School of Public Health. *Calcium and Milk*. 2009.
Journal of the American Medical Association. 2005;293:1082-1088.
Journal of Bone Mineral Metabolism. 2005;23:186-190.

Journal of Bone and Mineral Research. 2004;19:1208-1214.
Journal of Bone and Mineral Research. 2003;18:343-351.
American Journal of Clinical Nutrition. 2001;73:118-122.
Nutrition. 2001;17:880-887.





Build Strong Bones

CHALLENGE
Do what you can to protect and strengthen your bones.

Instructions

1. Post this record sheet where you will see it daily (bathroom, kitchen, bedroom, etc.).
2. Put an "X" in the box on those days you did weight-bearing and weightlifting exercises. Also record the number of days you ate a bone-healthy diet. Use this calendar to also record weight and any other items you may want to track.
3. You must do weight-bearing and strengthening exercises and eat a bone-healthy diet on at least 22 days out of the month to complete the Challenge. Then keep up this healthy practice for a lifetime of best health!
4. Keep this record for evidence of completion.

MONTH:

HC = Health Challenge™ • ex. min. = exercise minutes

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	Weight & weekly summary
HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	
HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	
HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	
HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	
HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	HC <input type="checkbox"/> ex. min. _____	

_____ Number of days this month I did bone-strengthening exercises and ate a bone-healthy diet

_____ Number of days this month I got 30+ minutes of physical activity such as brisk walking

Other wellness projects completed this month:

Signature _____ Date _____

