# Osteoporosis

Osteoporosis is a disease of the bones. It happens when you lose too much bone, make too little bone or both. As a result, bones become weak and can break from a minor fall or, in serious cases, from a simple action such as a sneeze or bumping into furniture.
If you're age 50 or older and have broken a bone, you should talk to your doctor or other healthcare provider about getting a bone density test. Osteoporosis means "porous bone." If you look at healthy bone under a microscope, you will see that parts of it look like a honeycomb. If you have osteoporosis, the holes and spaces in the honeycomb are much bigger than they are in healthy bone. This means your bones have lost density or mass. It also means that the structure of your bone tissues has become abnormal. As your bones become less dense, they become weaker.

## Osteoporosis Is Common

1 out of 8 males and 1 out of 3 females in India suffers from osteoporosis, making India one of the largest affected countries in the world. Expert groups peg the number of osteoporosis patients at approximately 36 million.

Two points worth noting about osteoporosis in India - the high incidence among men and the lower age of peak incidence compared to Western countries.

The incidence of hip fracture is 1 woman to 1 man in India

In most Western countries, while the peak incidence of osteoporosis occurs at about 70-80 years of age, in India it may afflict those 10-20 years younger, at age 50-60.

## Osteoporosis Is Serious

Breaking a bone is a serious complication of osteoporosis, especially when you're older. Broken bones due to osteoporosis are most likely to occur in the hip, spine and wrist, but other bones can break too. Broken bones can cause severe pain that may not go away. Some people lose height and become shorter. It can also affect your posture, causing you to become stooped or hunched. This happens when the bones of the spine, called vertebrae, begin to break or collapse.
Osteoporosis may even keep you from getting around easily and doing the things you enjoy. This can make you feel isolated and depressed. It can also lead to other health problems. Twenty percent of seniors who break a hip die within one year from problems related to the broken bone itself or surgery to repair it. Many of those who survive need long-term nursing home care.
*Often, breaking a bone is the first clue that you have osteoporosis.*

## Osteoporosis Can Sneak up on You

Often called the "silent disease", you could have osteoporosis now or be at risk for it without even realizing it. You can't feel your bones becoming weaker. Often, breaking a bone is the first clue that you have osteoporosis. Or, maybe you notice that you are getting shorter or your upper back is curving forward. At this point the disease may be advanced.

## Are You at Risk?

There are a variety of factors that can put you at risk for developing osteoporosis. These include both controllable and uncontrollable factors. It is important to discuss your risk factors with your healthcare provider. Together, you can develop a plan to protect your bones.

*A woman's risk of breaking a hip due to osteoporosis is equal to her risk of breast, ovarian and uterine cancer combined; a man age 50 or older is more likely to break a bone due to osteoporosis than he is to get prostate cancer.*

## Uncontrollable Risk Factors

- Being over age 50.
- Being Female.
- Menopause.
- Family History.
- Low Body Weight/Being Small and Thin.
- Broken Bones or Height Loss.

## Controllable Risk Factors

- Not Getting Enough Calcium and Vitamin D.
- Not Eating Enough Fruits and Vegetables.
- Getting Too Much Protein, Sodium and Caffeine.
- Having an Inactive Lifestyle.
- Smoking.
- Drinking too much alcohol.
- Losing Weight.

There are also medications and diseases that can cause bone loss and increase your risk of osteoporosis.

## Diseases and Conditions that May Cause Bone Loss

Many health problems can increase your chance of getting osteoporosis. Diseases and conditions that may cause bone loss include:

### Autoimmune Disorders

**Rheumatoid Arthritis (RA).** RA is a form of arthritis that is associated with an increased risk for osteoporosis. Steroid medicines, which are used to treat RA, can also increase the risk of osteoporosis.

**Lupus.** People with lupus may need to take medicines, including steroids, to control their symptoms. These medicines can lead to bone loss and osteoporosis.

**Multiple sclerosis**

**Ankylosing spondylitis**

### Digestive and Gastrointestinal Disorders

**Celiac Disease.** People with celiac disease have trouble digesting foods with gluten. Gluten is found in grains such as wheat, rye and barley. People with celiac disease also have problems

absorbing nutrients, including calcium and vitamin D. Celiac disease doesn't always cause noticeable symptoms. Ask your doctor if you should have a test for celiac disease.

**Inflammatory Bowel Disease (IBD).** Different forms of IBD, such as **Crohn's disease** and**ulcerative colitis**, can cause bone loss. Steroid medicines are often used to treat these conditions, which can also contribute to bone loss. People with IBD may also have trouble absorbing the calcium and vitamin D needed for healthy bones.

**Weight Loss Surgery.** Weight loss procedures such as **gastric bypass surgery** can help people lose a large amount of weight in a short period of time. This weight loss may lead to bone loss. These procedures can also interfere with the body's ability to properly absorb the vitamins and minerals needed for bone health.

**Gastrectomy**

**Gastrointestinal bypass procedures**

**Endocrine/Hormonal Disorders**

**Diabetes.** People with diabetes have a higher risk of developing osteoporosis. While type 1 diabetes seems to cause the greatest amount of bone loss, people with both type 1 and type 2 diabetes have an increased risk of breaking bones.

**Hyperparathyroidism** is a condition in which the parathyroid glands (two pairs of small glands located behind the thyroid in the neck) produce too much parathyroid hormone (PTH). Having too much PTH causes bone loss. This condition is more common in women after menopause. A simple blood test can detect this problem.

**Hyperthyroidism** is a condition in which the thyroid gland produces too much thyroid hormone. This can lead to weak muscles and fragile bones. Bone loss can also occur if a person takes too much thyroid hormone medicine for an underactive thyroid.

**Cushing's syndrome**

**Thyrotoxicosis**

**Missing Periods.** If you are a young woman and don't have regular periods, this could mean low estrogen levels. There could be many reasons for this, such as exercising too much or eating so little that you become too thin. Other causes of irregular periods could include disorders of the ovaries or pituitary. Loss of estrogen and extreme thinness can harm bones and affect other body systems. Young women who don't have regular periods should talk to their healthcare provider about their bone health.

**Premature Menopause**

**Testosterone and Estrogen Levels in Men.** Testosterone protects bone. Very low levels of testosterone suggest that there is an underlying disorder that needs to be evaluated. Estrogen levels in men are also important. Low levels of these hormones can lead to bone loss. A number of factors can cause levels to be low, such as an eating disorder or drinking too much alcohol. A blood test can tell you if your hormone levels are normal.

**Hematologic/Blood Disorders**

**Leukemia and Lymphoma.** Many of the medicines, including chemotherapy, used to treat these two forms of cancer can lead to bone loss and osteoporosis.

**Multiple Myeloma.** Multiple myeloma is a cancer of the bone marrow. Its first symptoms may be back pain and broken bones in the spine. Blood and urine tests can detect the

problem. Other forms of cancer that affect bones or bone marrow can also cause broken bones.

**Sickle Cell Disease.** People with sickle cell disease may need to take medicines, including steroids, to control their symptoms. These medicines can lead to bone loss and osteoporosis.

**Blood and bone marrow disorders**

**Thalassemia**

**Neurological/Nervous System Disorders**

**Stroke**, **Parkinson's disease** and **multiple sclerosis (MS)** reduce mobility. People with these conditions are more likely to be inactive, fall and have low vitamin D levels.

**Spinal cord injuries**

**Mental Illness**

**Depression.** Research suggests that people with depression are more likely to have low bone density or osteoporosis. This link is probably due to multiple factors, including the use of selective serotonin reuptake inhibitors (SSRIs) medicines. More studies will help us better understand the relationship between depression and osteoporosis.

**Eating Disorders.** In women with **anorexia nervosa**, estrogen levels decrease to such an extent that menstrual periods either become irregular or stop. This drop in estrogen can cause bone loss and osteoporosis. In addition to causing low estrogen levels, anorexia nervosa and **other eating disorders** can lead to bone loss in females and males for other complex reasons.

**Cancer**

**Breast Cancer.** Aromatase inhibitors are commonly used to treat women with estrogen-sensitive breast cancer. Because these medicines reduce the amount of estrogen in the body, they can lead to bone loss and broken bones.

**Prostate Cancer.** Androgen deprivation therapy is commonly used to treat men with prostate cancer. Because these medicines reduce the amount of male sex hormones in the body, they can lead to bone loss and broken bones.

**Other Diseases and Conditions**

**AIDS/HIV**

**Chronic obstructive pulmonary disease (COPD)**, including emphysema

**Female athlete triad** (includes loss of menstrual periods, an eating disorder and excessive exercise)

**Kidney disease** that is chronic and long lasting

**Liver disease** that is severe, including biliary cirrhosis

**Organ Transplants.** People who have organ transplants must take medicines to prevent their bodies from rejecting their new organs. Some of these drugs can weaken bones.

**Polio and post-polio syndrome**

**Poor diet, including malnutrition**

**Scoliosis**

**Weight loss**

**Note:** This list may not include all diseases and conditions that may cause bone loss.

## Medicines that May Cause Bone Loss

Some medicines can be harmful to your bones, even if you need to take these medicines for another condition. Bone loss is usually greater if you take them in high doses or for a long time. It's important to talk with your healthcare provider about the risks and benefits of any medicines you take and about how they may affect your bones. Do not stop any treatment or change the dose of your medicines unless your healthcare provider says it's safe to do so. If you need to take a medicine that causes bone loss, work with your healthcare provider to take the lowest possible dose to control your symptoms.

Below is a list of medicines that may cause bone loss.

- Aluminum-containing antacids
- Antiseizure medicines (only some) such as Dilantin® or Phenobarbital
- Aromatase inhibitors such as Arimidex®, Aromasin® and Femara®
- Cancer chemotherapeutic drugs
- Cyclosporine A and FK506 (Tacrolimus)
- Gonadotropin releasing hormone (GnRH) such as Lupron® and Zoladex®
- Heparin
- Lithium
- Medroxyprogesterone acetate for contraception (Depo-Provera®)
- Methotrexate
- Proton pump inhibitors (PPIs) such as Nexium®, Prevacid® and Prilosec®
- Selective serotonin reuptake inhibitors (SSRIs) such as Lexapro®, Prozac® and Zoloft®
- Steroids (glucocorticoids) such as cortisone and prednisone
- Tamoxifen® (premenopausal use)
- Thiazolidinediones such as Actos® and Avandia®
- Thyroid hormones in excess

Note: This list may not include all medicines that may cause bone loss.

## Osteoporosis and Steroid Medicines

While steroid medicines can be lifesaving treatments for some conditions, they can also cause bone loss and osteoporosis. These medicines are often referred to as steroids, glucocorticoids or corticosteroids. They should not be confused with anabolic steroids, which are male hormones that some athletes use to build muscle.

Steroids are much like certain hormones made by your own body. Healthcare providers prescribe them for many conditions, including rheumatoid arthritis (but not osteoarthritis), asthma, Crohn's disease, lupus and allergies. They are often prescribed to relieve inflammation. They are also used along with other medicines to treat cancer and autoimmune conditions and to support organ transplants. Common steroid medicines are cortisone, dexamethasone (Decadron®), methylprednisolone (Medrol®) and prednisone. Intravenous forms include methylprednisolone sodium succinate (Solu-Medrol®).

Taking steroid medicines as pills in a dose of 5 mg or more for three or more months can increase the chance of bone loss and developing osteoporosis. Talk with your healthcare provider about taking the lowest dose for the shortest period of time for your condition. If you need to take steroid medicines for longer than this, you should take steps to prevent bone

loss. While taking steroids, it is especially important to get enough calcium and vitamin D. It's also important to exercise and not smoke. You may also want to ask your healthcare provider if you need a bone density test.

## Making a Diagnosis

A medical evaluation to diagnose osteoporosis and estimate your risk of breaking a bone may involve one or more of the following steps:

1. **Medical history**
2. **Physical examination**
3. **Bone density test**
4. **Laboratory tests**

Other tests that may be used to get information about your bone health, but are not used to diagnose osteoporosis include biochemical marker tests, x-rays, vertebral fracture assessments (VFAs), and bone scans.

### 1.Medical History

Your healthcare provider will ask questions to better understand your risk. Factors he or she may consider include:

- Your age
- Your gender
- Whether you have reached menopause (women)
- Your personal history of broken bones as an adult
- Your family history of broken bones and osteoporosis
- Your smoking or drinking habits
- Your diet, including how much calcium and vitamin D you get
- Your exercise and physical activity
- Whether you have had an eating disorder such as anorexia nervosa
- Whether you have had regular periods (premenopausal women)
- Your testosterone levels (men)
- Whether you take any medicines or have any medical conditions that may cause bone loss

### 2. Physical Examination

Your healthcare provider may measure you to see if you have lost height and examine your spine. After age 50, you should have your height checked without shoes every year at the same healthcare provider's office.

### 3. Bone Density Test

A bone density test is the only test that can diagnose osteoporosis before a broken bone occurs. This test helps to estimate the density of your bones and your chance of breaking a bone

## Having a Bone Density Test

You can find out whether you have osteoporosis or if you should be concerned about your bones by getting a bone density test. Some people also call it a bone mass measurement test. This test uses a machine to measure your bone density. It estimates the amount of bone in your hip, spine and sometimes other bones.

### Who Should Have a Bone Density Test?

Have a bone density test if:

- you are a woman age 65 or older
- you are a man age 70 or older
- you break a bone after age 50
- you are a woman of menopausal age with risk factors
- you are a postmenopausal woman under age 65 with risk factors
- you are a man age 50-69 with risk factors

A bone density test may also be necessary if you have any of the following:

- an X-ray of your spine showing a break or bone loss in your spine
- back pain with a possible break in your spine
- height loss of ½ inch or more within one year
- total height loss of 1½ inches from your original height

### Understanding Bone Density Test Results

Your bone density test results are reported using **T-scores**. A T-score shows how much your bone density is higher or lower than the bone density of a healthy 30-year old adult. A healthcare provider looks at the lowest T-score to diagnosis osteoporosis.

**What Your T-score Means.** According to the World Health Organization (WHO):

- A T-score of -1.0 or above is normal bone density. Examples are 0.9, 0 and -0.9.
- A T-score between -1.0 and -2.5 means you have low bone density or osteopenia. Examples are T-scores of -1.1, -1.6 and -2.4.
- A T-score of -2.5 or below is a diagnosis of osteoporosis. Examples are T-scores of -2.6, -3.3 and -3.9.

The lower a person's T-score, the lower the bone density. A T-score of -1.0 is lower than a T-score of 0.5 and a T-score of -3.5 is lower than a T-score of -3.0.

| **Guide to Understanding T-scores** | | |
|---|---|---|
| **Category** | T-scores | |
| | Range | Examples |
| **Normal Bone Density** | -1 and above | +0.5 |
| | | 0 |

| | | |
|---|---|---|
| | | -1.0 |
| **Low Bone Density (Osteopenia)** | Between -1 and -2.5 | -1.1 |
| | | -1.5 |
| | | -2.4 |
| **Osteoporosis** | -2.5 and below | -2.5 |
| | | -3.0 |
| | | -4.0 |

### When to Consider Treatment

The results of a bone density test help your healthcare provider make recommendations about what you can do to reduce your chance of breaking a bone. When making a decision about treatment with an osteoporosis medicine, your healthcare provider will also consider your risk factors for osteoporosis, your likelihood of breaking a bone in the future, your medical history and your current health.

Below are treatment guidelines for postmenopausal women and men age 50 or older:

- Most people with T-scores of -1.0 and above (normal bone density) do not need to take an osteoporosis medicine.
- Some people with T-scores between -1.0 and -2.5 (low bone density or osteopenia) should consider taking an osteoporosis medicine when they have certain risk factors.
- All people with T-scores of -2.5 and below (osteoporosis) should consider taking an osteoporosis medicine.

### 4.Laboratory Tests

- Blood and urine tests can be used to identify possible causes of bone loss. Some of these tests include:
- Blood calcium levels
- 24-hour urine calcium measurement
- Thyroid function tests
- Parathyroid hormone levels
- Testosterone levels in men
- 25-hydroxyvitamin D test to determine whether the body has enough vitamin D
- Biochemical marker tests, such as NTX and CTX

Some of the tests listed above can help to identify if you have another medical condition that is causing bone loss. This is called secondary osteoporosis. Depending on your symptoms and other risk factors, your healthcare provider may want to test you for other conditions that can cause bone loss. If you have another condition that is causing bone loss, treating that

condition will usually help your bone health. But, for many people, there is often no known cause for their bone loss or osteoporosis.

### 5.Other Tests to Evaluate Bone Health

Biochemical marker tests of the blood and/or urine may help to estimate how fast you're losing or making bone. X-Rays and Vertebral Fracture Assessments (VFAs) can show breaks in the spine.

Nuclear bone scans, CT Scans or MRIs can show changes that may be caused by cancer, bone lesions, inflammation, new broken bones or other conditions. They are often used to help find the cause of back pain or to follow up on abnormalities seen on an x-ray.

## Prevention and Healthy Living

Osteoporosis and the broken bones it can cause are not part of normal aging. There is a lot you can do to protect your bones throughout your life. You're never too young or too old to improve the health of your bones. Osteoporosis prevention should begin in childhood. But it shouldn't stop there. Whatever your age, the habits you adopt now can affect your bone health for the rest of your life. Now is the time to take action.

### What can you do to protect your bones?

- Get enough calcium and vitamin D and eat a well balanced diet.
- Engage in regular exercise.
- Eat foods that are good for bone health, such as fruits and vegetables.
- Avoid smoking and limit alcohol to 2-3 drinks per day.

### Calcium and Vitamin D

Getting enough calcium and vitamin D are essential to building stronger, denser bones early in life and to keeping bones strong and healthy later in life. Calcium and vitamin D are the two most important nutrients for bone health.

**How Much Vitamin D Do You Need?**

| **Women and Men** | |
|---|---|
| Under age 50 | 400-800 international units (IU) daily** |
| Age 50 and older | 800-1,000 IU daily** |

**Some people need more vitamin D.

### What is Calcium and What does it Do?

Calcium is a mineral that is necessary for life. In addition to building bones and keeping them healthy, calcium helps blood clot, nerves send messages, muscles contract and other body functions. About 99 percent of the calcium in our bodies is in our bones and teeth. Each day,

you lose calcium through your skin, nails, hair, sweat, urine and feces. Our bodies cannot produce calcium.
That's why it's important to try to get enough calcium through the foods we eat. When we don't get enough calcium for our body's needs, calcium is taken from our bones.
*Many of us do not get the amount of calcium they need every day. Not getting enough calcium can lead to low bone density, bone loss and higher numbers of broken bones.*

**How Much Calcium do You Need?**

| | |
|---|---|
| **Women** | |
| Under age 50 | 1,000 mg* daily |
| Age 50 and older | 1,200 mg* daily |
| **Men** | |
| Under age 71 | 1,000 mg* daily |
| Age 71 and older | 1,200 mg* daily |

**Sources of Calcium**

**Calcium-Rich Food Sources**

Food is the best source of calcium. Dairy products, such as low-fat and non-fat milk, yogurt and cheese are high in calcium. Certain green vegetables and other foods contain calcium in smaller amounts. Some juices, breakfast foods, soymilk, cereals, snacks, breads and bottled water have calcium that has been added. If you drink soymilk or another liquid that is fortified with calcium, be sure to shake the container well as calcium can settle to the bottom.
*A simple way to add calcium to many foods is to add a single tablespoon of nonfat powdered milk, which contains about 50 mg of calcium. About two-to-four tablespoons can be added to most recipes.*

**Calcium Supplements**

The amount of calcium needed from a calcium supplement depends on the amount of calcium you get from foods. If you get enough calcium from the foods you eat, then you don't need to take a supplement. Taking more calcium than you need in supplements does not have added benefits and can even have some risks. You shouldn't take supplements that you don't need.Calcium supplements are available without a prescription in a wide range of preparations (including chewable and liquid) and in different amounts. The best supplement is the one that meets your needs based on convenience, cost and availability. However, here are some things to keep in mind when choosing a supplement:

- **Calcium is absorbed best when taken in amounts of 500 – 600 mg or less.** This is the case when you eat calcium rich foods or take supplements. Try to get your calcium-rich foods and/or supplements in smaller amounts throughout the day, preferably with a meal. However, taking your calcium all at once is better than not taking it at all.
- **You should take most calcium supplements with food.** Eating food produces stomach acid that helps your body absorb most calcium supplements. The one exception to this rule is calcium citrate, which can absorb well when taken with or without food.
- **When starting a new calcium supplement, it may be better tolerated if you start with a smaller amount.** For example, start with 200-300 mg of calcium every day for a week, and drink an extra 6-8 ounces of water with it. Then gradually add more calcium each week.
- **Side effects from calcium supplements, such as gas or constipation may occur.** If increasing fluids in your diet does not solve the problem, try another type or brand of calcium. It may require trial and error, but fortunately there are many choices.

## What is Vitamin D and What Does it Do?

Vitamin D (link) plays an important role in protecting your bones. Your body requires vitamin D to absorb calcium. Children need vitamin D to build strong bones, and adults need it to keep bones strong and healthy. When people do not get enough vitamin D, they can lose bone, have lower bone density, and are more likely to break bones when they are older.

**Sources of Vitamin D**

There are three ways to get vitamin D:

- Sunlight
- Food
- Supplements

### *Sunlight*

Your skin makes vitamin D from the ultra-violet light (UVB rays) in sunlight. Your body is able to store the vitamin and use it later. The amount of vitamin D your skin makes depends on time of day, season, latitude, skin pigmentation and other factors. Depending on where you live, vitamin D production may decrease or be completely absent during the winter.

Because of concerns about skin cancer, many people stay out of the sun, cover up with clothing and use either sunscreen or sunblock to protect their skin. The use of sunscreen or sunblock is probably the most important factor that limits the ability of the skin to make vitamin D. Even an SPF (sun protection factor) of 8 reduces the production of vitamin D by 95 percent. Because of the cancer risk from staying in the sun, many people need to get vitamin D from other sources such as by eating foods rich in vitamin D and vitamin D supplements.

### *Food*

Vitamin D is naturally available in only a few foods including fatty fish (examples are wild-caught mackerel, salmon and tuna). Vitamin D is also added to milk and to some brands of other dairy products, orange juice, soymilk and cereals.

Check the food label to see if vitamin D has been added to a particular product. One eight ounce serving of milk usually has 25% of the daily value (DV) of vitamin D. The DV is based on a total daily intake of 400 IU of vitamin D. Therefore a serving of milk with 25% of the DV of vitamin D contains 100 IU of the vitamin.

It is very difficult to get all the vitamin D you need from food alone. Many people need to take vitamin D supplements to get enough of the nutrient needed for bone health.

***Supplements***

People who do not get enough vitamin D should consider taking a supplement. Before adding a vitamin D supplement, check whether any supplements, multivitamins or medications you already take contain vitamin D. Many calcium supplements also contain vitamin D.

There are two types of vitamin D supplements. They are vitamin D2 (ergocalciferol) and vitamin D3 (cholecalciferol). Both types are good for bone health.

Vitamin D supplements can be taken with or without food. While your body needs vitamin D to absorb calcium, you do not need to take vitamin D at the same time as a calcium supplement. If you need help choosing a vitamin D supplement, ask your healthcare provider or pharmacist to recommend one.

There are two types of vitamin D supplements. They are vitamin D2 (ergocalciferol) and vitamin D3 (cholecalciferol). Both types of vitamin D are good for bone health.

Vitamin D supplements can be taken with or without food. While your body needs vitamin D to absorb calcium, you do not need to take vitamin D at the same time as a calcium supplement. If you need help choosing a vitamin D supplement, ask your healthcare provider or pharmacist to recommend one.

***How Much Vitamin D Are You Getting?***

*Subtract the total amount of vitamin D you are already getting each day from the total amount you need to get each day. For example, a 55 year old woman who gets 400 IU of vitamin D from her calcium supplement should take between 400 and 600 additional IU of vitamin D to meet the 800 - 1,000 IU of vitamin D that is recommended for her age.*

## Vitamin D Deficiency: Are You at Risk?

Vitamin D deficiency is when you are not getting the recommended levels of the nutrient over time. Certain people are at risk for vitamin D deficiency. These include:

- people who spend little time in the sun or those who regularly cover up when outdoors
- people living in nursing homes or other institutions or who are homebound
- people taking medicines that affect vitamin D levels such as certain anti-seizure medicines
- people with very dark skin
- obese or very overweight people
- older adults with certain risk factors

## Food and Your Bones

Certain foods can affect your bones. Learning about these foods can help you make healthier food choices every day. Here are some examples of foods that are rich in calcium, vitamin D and other nutrients that appear to be important for bone health and overall health.

### Good-for-Your-Bones Foods

| Food | Nutrient |
|---|---|
| Dairy products such as low-fat and non-fat milk, yogurt and cheese | Calcium. Some dairy products are fortified with Vitamin D. |
| **Fish** | |
| Canned sardines and salmon (with bones) | Calcium |
| Fatty varieties such as salmon, mackerel, tuna and sardines | Vitamin D |
| **Fruits and vegetables** | |
| Collard greens, turnip greens, kale, okra, Chinese cabbage, dandelion greens, mustard greens and broccoli. | Calcium |
| Spinach, beet greens, okra, tomato products, artichokes, plantains, potatoes, sweet potatoes, collard greens and raisins. | Magnesium |
| Tomato products, raisins, potatoes, spinach, sweet potatoes, papaya, oranges, orange juice, bananas, plantains and prunes. | Potassium |
| Red peppers, green peppers, oranges, grapefruits, broccoli, strawberries, brussels sprouts, papaya and pineapples. | Vitamin C |
| Dark green leafy vegetables such as kale, collard greens, spinach, mustard greens, turnip greens and brussel sprouts. | Vitamin K |
| **Fortified Foods** | |

| Food | Nutrient |
|---|---|
| Calcium and vitamin D are sometimes added to certain brands of juices, breakfast foods, soy milk, rice milk, cereals, snacks and breads. | Calcium, Vitamin D |

If you eat a well-balanced diet, you should be getting enough of these nutrients. If not, you may need to take multivitamins or supplements.

## More Tips for Eating for Good Bone Health

**Beans (legumes).** While beans contain calcium, beans contain magnesium, fiber and other nutrients, they are also high in substances called phytates. Phytates interfere with your body's ability to absorb the calcium that is contained in beans. You can reduce the phytate level by soaking beans in water for several hours and then cooking them in fresh water.

**Meat and other high protein foods.** It's important to get enough, but not too much protein for bone health and overall health. Many older adults do not get enough protein in their diets and this may be harmful to bones. However, special high protein diets that contain multiple servings of meat and protein with each meal can also cause the body to lose calcium. You can make up for this loss by getting enough calcium for your body's needs. For example dairy products, although high in protein, also contain calcium that is important for healthy bones.

**Salty foods.** Eating foods that have a lot of salt (sodium) causes your body to lose calcium and can lead to bone loss. Try to limit the amount of processed foods, canned foods and salt added to the foods you eat each day. To learn if a food is high in sodium, look at the Nutrition Facts label. if it lists 20% or more for the % Daily Value, it is high in sodium. Aim to get 2,400 mg or less of sodium per day.

**Spinach and other foods with oxalates.** Your body doesn't absorb calcium well from foods that are high in oxalates (oxalic acid) such as spinach. Other foods with oxalates are rhubarb, beet greens and certain beans. These foods contain other healthy nutrients, but they just shouldn't be counted as sources of calcium.

**Wheat bran.** Like beans, wheat bran contains high levels of phytates which can prevent your body from absorbing calcium. However, unlike beans 100% wheat bran is the only food that appears to reduce the absorption of calcium in other foods eaten at the same time. For example, when you have milk and 100% wheat bran cereal together, your body can absorb some, but not all, of the calcium from the milk. The wheat bran in other foods like breads is much less concentrated and not likely to have a noticeable impact on calcium absorption. If you take calcium supplements, you may want to take them two or more hours before or after eating 100% wheat bran.

**Alcohol and Caffeine**

**Alcohol.** Drinking heavily can lead to bone loss. Limit alcohol to no more than 2 - 3 drinks per day.

**Caffeine.** Coffee, tea and soft drinks (sodas) contain caffeine, which may decrease calcium absorption and contribute to bone loss. Choose these drinks in moderation.

**Coffee/tea.** Drinking more than three cups of coffee every day may interfere with calcium absorption and cause bone loss.

**Soft drinks.** Some studies suggest that colas, but not other soft drinks, are associated with bone loss. While more research will help us to better understand the link between soft drinks and bone health, here is what we know:

The carbonation in soft drinks does not cause any harm to bone. The caffeine and phosphorous commonly found in colas may contribute to bone loss. Like calcium, phosphorous is a part of the bones. It is listed as an ingredient in colas, some other soft drinks and processed foods as "phosphate" or "phosphoric acid."

The harm to bone may actually be caused when people choose soft drinks over milk and calcium-fortified beverages.

Luckily you can help make up for any calcium lost from these beverages by getting enough calcium to meet your body's needs.

## Exercise for Strong Bones

There are two types of exercises that are important for building and maintaining bone density: **weight-bearing** and **muscle-strengthening** exercises.

### Weight-bearing Exercises

These exercises include activities that make you move against gravity while staying upright. Weight-bearing exercises can be **high-impact** or **low-impact**.

**High-impact weight-bearing exercises** help build bones and keep them strong. If you have broken a bone due to osteoporosis or are at risk of breaking a bone, you may need to avoid high-impact exercises. If you're not sure, you should check with your healthcare provider.

Examples of high-impact weight-bearing exercises are:

- Dancing
- Doing high-impact aerobics
- Hiking
- Jogging/running
- Jumping Rope
- Stair climbing
- Tennis

**Low-impact weight-bearing exercises** can also help keep bones strong and are a safe alternative if you cannot do high-impact exercises. Examples of low-impact weight-bearing exercises are:

- Using elliptical training machines
- Doing low-impact aerobics
- Using stair-step machines
- Fast walking on a treadmill or outside

### Muscle-Strengthening Exercises

These exercises include activities where you move your body, a weight or some other resistance against gravity. They are also known as resistance exercises and include:

- Lifting weights
- Using elastic exercise bands
- Using weight machines
- Lifting your own body weight
- Functional movements, such as standing and rising up on your toes

Yoga and Pilates can also improve strength, balance and flexibility. However, certain positions may not be safe for people with osteoporosis or those at increased risk of broken bones. For example, exercises that have you bend forward may increase the chance of breaking a bone in the spine. A physical therapist should be able to help you learn which exercises are safe and appropriate for you.

**Non-Impact Exercises**

Non-impact exercises can help you to improve balance, posture and how well you move in everyday activities. These exercises can also help to increase muscle strength and decrease the risk of falls and broken bones. Some of these exercises include:

- **Balance exercises** that strengthen your legs and test your balance, such as Tai Chi, can decrease your risk of falls.
- **Posture exercises** that improve your posture and reduce rounded or "sloping" shoulders can help you decrease the chance of breaking a bone, especially in the spine.
- **Functional exercises** that improve how well you move can help you with everyday activities and decrease your chance of falling and breaking a bone. For example, if you have trouble getting up from a chair or climbing stairs, you should do these activities as exercises.

A physical therapist can teach you balance, posture and functional exercises.

.

## How Much Exercise Do You Need?

| | |
|---|---|
| **Weight-bearing exercises** | **30 minutes on most days of the week.** Do a 30-minutesession or multiple sessions spread out throughout the day. The benefits to your bones are the same. |
| **Muscle-strengthening exercises** | **Two to three days per week.** If you don't have much time for strengthening/resistance training, do small amounts at a time. You can do just one body part each day. For example do arms one day, legs the next and trunk the next. You can also spread these exercises out during your normal day. |
| **Balance, posture and functional exercises** | **Every day or as often as needed.** You may want to focus on one area more than the others. If you have fallen or lose your balance, spend time doing balance exercises. If you are getting rounded shoulders, work more on posture exercises. If you have trouble climbing stairs or getting up from the couch, do more functional exercises. You can also perform these exercises at one time or spread them during your day. Work with a physical therapist to learn the right exercises for you. |

Adapted from :CDC

:International Osteoporosis Foundation