



X-Plain Osteoporosis Reference Summary

Introduction

Osteoporosis is a very common bone disease that causes bone to become weak. Bone weakness can lead to fractures of the spine, hip, and wrist from simple falls or even a sneeze or a cough!

About 10 million Americans have osteoporosis, 80% of them are women. One in two women has a fracture related to osteoporosis in her lifetime! The good news is that osteoporosis can be prevented and treated.

This reference summary will help you understand what osteoporosis is, as well as its symptoms, causes, diagnosis, and treatment options. Also included are tips for prevention.

Osteoporosis

Bone is a living tissue. It is mostly made of *collagen*, a protein that provides a soft framework and calcium phosphate, a mineral that hardens the framework. Our bones are continually replenished throughout life. The body deposits new bone and removes old bone.

During childhood, more new bone is formed than old bone removed. The body's bone is the most dense and strong around age 30. After age 30, the body starts removing more old bone than forming new bone! There are two main reasons why osteoporosis may occur.

- If a person does not have enough strong bone mass by age 30 before bone loss begins.
- If bone loss after age 30 happens too fast.



Skeletal System

Symptoms

People may not know that they have osteoporosis until their bones become so weak that a sudden strain, bump, or fall causes a hip fracture or a collapsed vertebra.

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A collapsed vertebra may cause severe back pain, spinal deformities, or severely stooped posture.

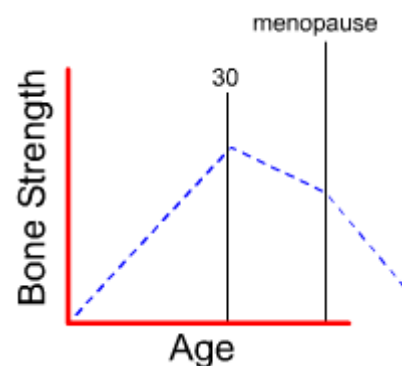
Fractures can affect most bones of the body, but they mostly involve the hips, vertebrae, wrist, and arms. Fractures can be very painful and very debilitating. The bones can become so weak that a sneeze or a cough could result in a vertebral fracture.

Causes

Osteoporosis can begin at a young age, if a person does not get enough calcium and vitamin D. After reaching maximum bone density and strength between the ages of 25 and 30, a person loses about 0.4% of bone strength each year. At this rate and with good nutrition, people should experience bone loss without developing osteoporosis.

After menopause, women lose bone mass at a higher rate, as high as 3% a year. A woman reaches menopause when she has the last period of her lifetime. After menopause, a woman's body makes much less estrogen. Estrogen is a hormone, a substance that flows in the blood to control bodily functions. It helps to prevent osteoporosis.

Fortunately, there are medications that women can take after menopause to replace lost estrogen. This can help women prevent osteoporosis.



Risk Factors

A person's gender is a risk factor; being a woman gives you a higher risk of having osteoporosis. A risk factor is something that increases the chances that a person will have a disease. The other main risk factors for osteoporosis are:

- Age: the older you are, the more likely are your chances of developing osteoporosis.
- Body size: the thinner your bone is, the more likely are your chances of developing osteoporosis.

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Two risk factors of osteoporosis that you cannot control are:

- Race: white and Asian women are more likely to have osteoporosis than African-American or Latino women are.
- Family: if your parents have osteoporosis, you are more likely to have it!

Fortunately, there are risk factors that you CAN control.

Calcium and vitamin D intake: if you do not get enough calcium (Ca) and vitamin D from your diet, you are more likely to have osteoporosis.

Smoking: if you smoke, you are more likely to develop osteoporosis.

Excess alcohol: if you drink excessively, you are more likely to develop osteoporosis.

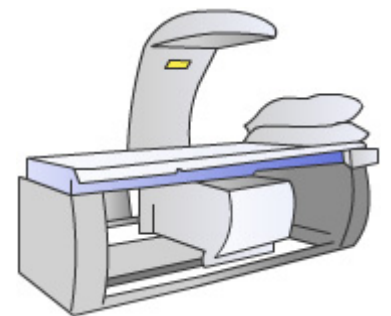
Inactivity: if you have an inactive lifestyle, you are more likely to have osteoporosis.

Medicine: Some medications increase the risk of osteoporosis, such as taking steroids or antacids for a long time.



Diagnosis

Medications are available to help people with osteoporosis. To diagnose osteoporosis, doctors use special tests to measure bone density. Two common tests for bone density are the Dual Energy Absorptiometry or DXA and the Sahara Clinical Bone Sonometer. The DXA uses X-rays and the sonometer uses ultrasound waves. Regular x-rays show thinning bone. However, by the time x-rays can reveal osteoporosis, the bones are already too weak and osteoporosis is in an advanced stage.



Dual Energy
Absorptiometry

Treatment

To treat osteoporosis, doctors may recommend:

- a healthy diet including calcium, vitamin D, and calcium supplements
- medication

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Food that includes calcium and vitamin D include dairy products, such as milk and cheese, and oranges. Calcium supplements are as effective as calcium from food. They are inexpensive and well tolerated by the body.

Sometimes calcium supplements may cause constipation. Drinking more water and eating food rich in fiber, such as vegetables and fruits, can help you avoid this.

Even though estrogen is very helpful in preventing osteoporosis, its use should be discussed with a gynecologist and should be monitored very closely. Hormone replacement therapy has several benefits but may also have several serious side effects. Some prescription medications help calcium get into new bone. Such medications include calcitonin, most commonly prescribed in the form of a nasal spray.

Other medications are available that help slow down bone loss. Some are of the biphosphonate family. Alendronate (Fosamax®) and risedronate (Actonel®) are such medications that can be taken by mouth.

Ibandronate (Boniva®) and Zoledronic acid (Reclast®) are given by IV, Boniva once every few months and Reclast once a year.



These medications have been shown to increase bone density and decrease the chances of future fractures. These medications do have some side effects. The most bothersome side effect is severe heartburn and upset stomach. This is caused by inflammation in the feeding tube which is also called the esophagus.

Some techniques have been devised to decrease the heart burn and upset stomach that can be seen with biphosphonates intake, these include:

1. Take the medication on an empty stomach with a tall glass of water.
2. Do not lie down or bend over for up to one hour after taking the medication.

If you develop redness of the eyes see your doctor immediately. Bone pain can be experienced and should be reported to your doctor. Some of the biphosphonates can lead to the deterioration and even death of a section of the jaws, especially when given in the vein and in very high doses, which is usually NOT the case for the treatment of osteoporosis. This potential complication is known as osteonecrosis of the jaw.

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Osteonecrosis of the jaw is more common in patients who have taken IV biphosphonates for the treatment of some types of bone cancer. This is why it is important to have your teeth and jaws checked before starting biphosphonates.

Raloxifene (Evista®) is a medication that has an estrogen like effect on bone metabolism. Unfortunately it may have some unwanted and potentially serious side effects such as blood clots in the legs.

Teriparatide (Forteo®) is an injectable medication that should be taken once a day for about 21 to 24 months. It is a normally occurring hormone that helps build more bone. Denosumab (Prolia®) is an injectable medication given every six months. It helps stop the breakdown of bone by blocking a chemical that promotes that breakdown.

Your doctor will help you decide which medication or combination of medications may be best suited for you.

Repeated scans may be necessary to follow up on the efficacy of the treatment.

Prevention

People of all ages can prevent osteoporosis through healthy life habits, including:

- a healthy, balanced diet rich in calcium and vitamin D
- staying active
- not smoking
- not drinking excessively



Exercise programs are encouraged but should be discussed with your doctor. Any sudden or excessive strain on your bones may lead to a fracture.

As people become older and their bones weaken, preventing falls is essential to avoid accidents that can be debilitating. People who develop osteoporosis should not lift, push, or pull heavy objects. They must be careful not to trip on thick carpet or throw rugs, or fall on slippery surfaces.

People with osteoporosis should keep their homes well lit and should take their time going from place to place, especially at night. Using a walker or a cane in unfamiliar surroundings can be helpful.

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Summary

Osteoporosis is a very common condition that can be prevented by good nutrition, and a healthy lifestyle. Many medications are now available to help prevent or treat osteoporosis after a woman reaches menopause. Calcium and vitamin supplements are also available and inexpensive. For people with osteoporosis, fracturing a bone is a main concern. Avoiding falls, tripping, and bumping into objects can prevent fractures and allow people with osteoporosis to live very healthy and productive lives!



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