

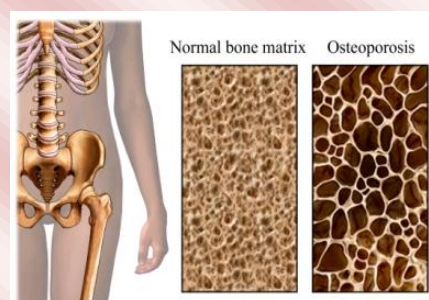
## Osteoporosis

Osteoporosis is a common disease that weakens bones. As it does, your risk of sudden and unexpected fractures goes up. Osteopenia is the forerunner of osteoporosis. It is a silent but destructive condition that robs bones during a woman's -- even a young woman's -- most productive time.

No matter what your age or sex, osteoporosis and osteopenia can affect you. Your bones might seem sturdy now. You may be very active and doing the things you want to do. But osteoporosis and osteopenia are quiet, accomplished thieves.

### What Are the Symptoms of Osteoporosis?

Osteoporosis often progresses without symptoms or pain. Losing height may be noticeable, or a Dowager's hump may develop with age. Usually, though, a doctor diagnoses osteoporosis after a painful fracture occurs. That fracture is usually in the back or hips. Painful fractures are debilitating and disfiguring. They can result in loss of mobility and independence.



### A Patient should call the doctor if:

- A backache or sudden severe back pain develops, which can indicate a spinal compression fracture caused by osteoporosis.
- Dental X-rays reveal a loss of bone in the jaw, which can be a sign of osteoporosis.

### What is the cause of osteoporosis?

Osteoporosis develops throughout a person's life. Bones are complex, living tissue. The body constantly breaks down old bone and rebuilds new bone. This bone-building process is called "remodeling." As you are growing up, your body builds more bone than it removes. During childhood, your bones become larger and stronger. Then, at a certain age, the bone remodeling process changes. New bones are built at a slower rate. This slowdown results in a decrease in the total amount of bone you have. If this loss of bone reaches a certain point, you have osteopenia. When bone loss becomes more severe, you have osteoporosis.

### Risks for osteoporosis

Key risk factors for fractures include the following:

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**Family history:** Osteoporosis seems to run in families. If your mother had hip fracture or spinal collapse fracture, chances are you are at risk for osteoporosis.

**Sex:** Women are four times more likely than men to get osteoporosis. But men also suffer from osteoporosis.

**Age:** Anyone of any age can have osteoporosis, but the risk of osteoporosis increases with age. Women over the age of 50 have the greatest risk of developing osteoporosis.

**Bone structure and body weight.** Petite and thin women have a greater risk of developing osteoporosis. Weight loss after age 50 in women also seems to increase the risk of hip fractures. Weight gain decreases the risk. Small-boned, thin men have a greater risk of osteoporosis than men with larger frames and more body weight.

**History of fractures:** Having one fracture increases the chance of more fractures.

**Smoking:** Smoking increases the risk of fractures. Studies show that cigarette smokers (past or current smokers) have lower bone densities and higher fracture risks. Women who smoke have lower levels of estrogen -- a key component for having healthy bones -- compared to nonsmokers. They also frequently go through menopause earlier.

**Medications:** Some medications may increase the risk of osteoporosis. These include long-term use of steroids (prednisone), thyroid medication, anticonvulsants, antacids, and other medications.

### How is osteoporosis related to menopause?

At menopause, there's a dramatic decline in the female hormone, estrogen. This decline in estrogen slows the bone remodeling process and causes an accelerated rate of bone loss. This more rapid loss of bone continues for about 10 years after menopause. The rate of bone loss eventually returns to premenopausal levels. But bone formation does not. This causes postmenopausal women to have a much greater chance of having a fracture. In addition, having an early menopause (before age 40) also increases the chance of osteoporosis and fractures. Having prolonged periods of time when hormone levels are low and/or absent, such as can happen with excess exercise, causes loss of bone mass and osteoporosis.

## Diagnosis

### *What Is Bone Mineral Density?*

Almost 80% of bone density is determined by heredity, and 20% by lifestyle. Bone mineral density tests (BMD) shows how dense bones are and whether you have osteoporosis.

### *Peak Bone Mass*

Around age 30, bones reach their maximum strength and density, known as peak bone mass.

## Tests

### *DEXA Scan (Dual X-ray Absorptiometry)*

The most common osteoporosis test is dual X-ray absorptiometry -- also called DXA or DEXA. It measures people's spine, hip or total body bone density to help gauge fracture risk.

### *Beyond DEXA: Other Bone Mineral Density Tests*

Various methods can check bone density, including ultrasound and quantitative computed tomography (QCT). Bone density scores and cost may vary by testing method. The doctor may

order a blood or urine test to see the metabolism of bone (Blood Test Markers). This provides clues to the progression of the disease.

### **Who Should Get Bone Density Testing?**

There are several groups of people who should consider bone density testing:

- All postmenopausal women below age 65 who have risk factors for osteoporosis.
- All women aged 65 and older.
- Postmenopausal women with fractures; this is not mandatory because treatment may well be started regardless of bone density.
- Women with medical conditions associated with osteoporosis; these diseases number more than 50. A primary care doctor can scan a patient's list of medical illnesses to verify that one of these conditions is not present.
- Women whose decision to use medication might be aided by bone density testing.

### **Osteoporosis Treatments**

Because osteoporosis is difficult to reverse, prevention is the key to treatment.

Calcium is the cornerstone of treatment. To help with the absorption of the calcium, vitamin D supplements should also be taken. Menopausal hormone replacement therapy -- either estrogen alone or a combination of estrogen and progestin -- was used for prevention and treatment of osteoporosis. However, in July 2002, a landmark study revealed that hormone therapy increases the risk of breast cancer, heart disease, and stroke in some women. Hormone replacement therapy is known to help preserve bone and prevent fractures, but is not generally recommended at this point for osteoporosis because the risks are thought to outweigh the benefits. In women who have been on hormone replacement therapy in the past and then stopped it, the bone begins to thin again -- at the same pace as during menopause.

**Evista** is an osteoporosis drug that has some actions similar to estrogen, such as the ability to maintain bone mass. However, studies have shown that it doesn't increase the risk of breast or uterine cancers like estrogen. Evista can cause blood clots and often increases hot flashes. **Actonel**, **Boniva**, and **Fosamax** (also available as generic) treat osteoporosis by inhibiting cells that break down bone and slowing bone loss. Actonel and Fosamax are usually taken once a week while Boniva is taken once a month. There are strict ways to take these medications, since if taken incorrectly; they can lead to ulcers in the esophagus. Another new osteoporosis medication is **Reclast**, which is given as a once-yearly 15-minute infusion in a vein. Reclast is said to increase bone strength and reduce fractures in the hip, spine and wrist, arm, leg, or rib.



**Forteo** is a new medication used for the treatment of osteoporosis in postmenopausal women and men who are at high risk for a fracture. A synthetic form of the naturally occurring parathyroid hormone, Forteo is the first drug shown to stimulate new bone formation and increase bone mineral density. It is self-administered as a daily injection for up to 24 months.

**Calcitonin** is another treatment option for osteoporosis. Calcitonin is a naturally occurring hormone that inhibits bone loss. It is available as a nasal spray or injection and is quite expensive.

### **Osteoporosis prevention through nutrition and diet**

To ensure that people are getting enough calcium to build and maintain strong bones, doctors recommend eating plenty of calcium-rich foods, such as nonfat milk, low-fat yogurt, broccoli, cauliflower, salmon, tofu, and leafy green vegetables. According to a panel, women who are

still menstruating, or who are postmenopausal but taking hormone replacement therapy, should get 1,000 mg of calcium each day. This jumps to 1,200 to 1,500 mg per day for pregnant or breastfeeding women. Postmenopausal women not on hormone replacement therapy should get 1,500 mg/day.

Recommended daily intake for men is 1,000 mg per day (25 to 65 years of age) and 1,500 mg per day from age 65 and up. One 8-ounce glass of skim milk has the same amount of calcium as whole milk, 300 mg. Because most women take in only half or a third as much calcium as they need through their diet, most doctors recommend calcium supplements to make up the difference. Calcium supplements are available in many forms, but calcium citrate and calcium gluconate appear to be more effective at reducing bone loss. To help the body absorb calcium, doctors suggest taking vitamin D (400 to 800 IU daily) supplements.

### Other Dietary Ways to Maintain Bone

In addition to eating calcium-rich foods, you should also avoid phosphorus-rich ones, which can promote bone loss. High-phosphorus foods include red meats, soft drinks, and those with phosphate food additives. Excessive amounts of caffeine are also thought to reduce the amount of calcium absorbed by the body and should be avoided.

### At-Home Remedies

Here are two easy ways to increase the amount of calcium in your diet:

- Add nonfat dry milk to everyday foods and beverages, including soups, stews, and casseroles. Each teaspoon of dry milk adds about 20 mg of calcium to your diet.
- Add a little vinegar to the water you use to make soup stock from bones. The vinegar will dissolve some of the calcium out of the bones, for a calcium-fortified soup. A pint can contain as much as 1,000 mg of calcium.

### Osteoporosis prevention through exercise

Studies have shown that weight-bearing exercises -- those that put stress on bones, such as running, walking, tennis, ballet, stair climbing, aerobics, and weightlifting -- reduce bone loss and help prevent osteoporosis. To benefit from the exercise, you must do it at least three times per week for 30 to 45 minutes.

**Reference:** - [www.webmd.com](http://www.webmd.com)



## Terminology

### ADHD

The term "**Attention Deficit Hyperactivity Disorder**" is abbreviated and usually referred to as ADHD. It's a family of related chronic neurobiological disorders that interfere with an individual's capacity to:

- regulate activity level (hyperactivity),
- inhibit behavior (impulsivity), and
- attend to tasks (inattention) in developmentally appropriate ways.

Children with ADHD have functional impairment across multiple settings including home, school, and peer relationships. ADHD has also been shown to have long-term adverse effects on academic performance, vocational success, and social-emotional development. Children with ADHD experience an inability to sit still and pay attention in class and there are negative consequences of such behavior. They experience peer rejection and engage in a broad array of disruptive behaviors. Their academic and social difficulties have far-reaching and long-term consequences. These children have



higher injury rates. As they grow older, children with untreated ADHD, in combination with conduct disorders, experience drug abuse, antisocial behavior, and injuries of all sorts. For many individuals, the impact of ADHD continues into adulthood.

Physical abnormalities of the brain have been detected in ADHD. Using high resolution MRI and surface-based computational image analytical techniques, it was found that people with ADHD have reductions in total brain volume and in the volumes of specific areas of the brain. These brain abnormalities may contribute to or even account for the symptoms of ADHD.

**Reference:** - [www.medicinenet.com](http://www.medicinenet.com)



## Complementary Medicine

### Echinacea



- Echinacea has traditionally been used to treat or prevent colds, flu, and other infections.
- Echinacea is believed to stimulate the immune system to help fight infections.
- Less commonly, echinacea has been used for wounds and skin problems, such as acne or boils.

#### How Echinacea Is Used

The aboveground parts of the plant and roots of echinacea are used fresh or dried to make teas, squeezed (expressed) juice, extracts, or preparations for external use.

### Chamomile

- Chamomile has been widely used in children and adults for thousands of years for a variety of health conditions.
- The herb is often used for sleeplessness; anxiety; and gastrointestinal conditions such as upset stomach, gas, and diarrhea.
- It is used topically for skin conditions and for mouth ulcers resulting from cancer treatment.



#### How Chamomile Is Used

The flowering tops of the chamomile plant are used to make teas, liquid extracts, capsules, or tablets. The herb can also be applied to the skin as a cream or an ointment, or used as a mouth rinse.

**Reference:** - *E-book: Herbs at a Glance*



## FDA Product Safety

### Thigh Creams (Cellulite Creams)

Various products have been promoted in the skin care market as thigh and stomach slimmers. Some advertising claims also promise the reduction of "cellulite", waffly looking or orange-peel type skin caused by fatty deposits.



Aminophylline, an approved prescription drug used in the treatment of asthma, is an ingredient used in many of these thigh cream products that marketers claim will dissolve the fat and smooth the skin. Since some individuals suffer from allergic reactions to ethylenediamine, a component of aminophylline, the FDA is concerned about the use of this ingredient in cosmetics.

Consumers need to be aware of this potential for developing an allergic reaction and carefully read product labels and follow directions. Persons who suffer from asthma may wish to avoid these products so that they don't develop a sensitization (become allergic) to aminophylline.

Drugs, unlike cosmetics, alter the structure or function of the body and are subject to an intensive review and approval process by FDA before their release to the public. Thigh creams may more appropriately be classified as drugs under the Food, Drug, and Cosmetic Act since removal or reduction of cellulite affects the "structure or function" of the body.

**Reference:** - [www.fda.gov](http://www.fda.gov)



## Test Your Knowledge

1- The FDA has recommended the removal of which ingredient found in cough/cold products due to an association with hemorrhagic stroke?

- |                     |                        |
|---------------------|------------------------|
| A. Dextromethorphan | B. Pseudoephedrine     |
| C. Guanfenisen      | D. Phenylpropanolamine |
| E. Ephedrine        |                        |

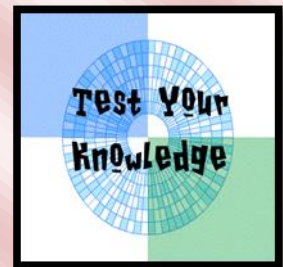
2- Zinc is most important for:

- |                         |                   |
|-------------------------|-------------------|
| A. blood cell formation | B. bone formation |
| C. oxidative processes  | D. normal growth  |
| E. muscle contractions  |                   |

3- A lack of speech coordination is:

- |              |                |
|--------------|----------------|
| A. dysphasia | B. parasthesia |
| C. dyspnea   | D. diplopia    |
| E. dyspraxia |                |

(You will find the right answers at the bottom of the last page)



## Real Enquiries

At the "Drug Information Center", we respond to enquiries from the professional health team as well as from others. Here's one of the interesting enquiries received at the center!

**Enquiry received from:** Prof. Nawal AbuBakr – Professor, Medicinal Chemistry Dept., Faculty of Pharmacy, Assiut University

**Enquiry:** Does coconut enhance the absorption of calcium?

### Summary of Answer:

Coconut is an excellent source of minerals. When you drink a cup of coconut milk, you actually consume 631mg of potassium and 240 mg of phosphorus. Thus, one can comfortably say that coconut milk is loaded with potassium, which is crucial for a healthy development of bone structure. Coconut oil improves the ability of our body to absorb important minerals. These include calcium and magnesium which are necessary for development of bones. Thus coconut oil is very useful for women who are prone to osteoporosis after middle age. Fats are necessary to get the fat-soluble vitamins A, D, E and K and beta-carotene. Vitamin D, particularly from the sun, has been known to be essential in calcium metabolism and is required for proper bone growth and development. Coconut oil does not block the sun's ultraviolet or UV rays that are vital for vitamin D synthesis. As a result, it improves calcium assimilation and bone health to the point of counteracting or preventing the progress of rickets. Unsaturated fats such as soybean and canola oils in the diet reduce the binding of vitamin D to D-binding proteins, making this anti-rickets vitamin less available for utilization in your kids' bodies. Unsaturated fats encourage vitamin D deficiency. 92% saturated coconut oil does not hamper this crucial binding activity. It naturally enhances the body's absorption of nutrients essential in the prevention and treatment of rickets.



## Drug-Drug interactions

### Anticoagulants + Glucagon

The anticoagulant effects of warfarin are rapidly and markedly increased by glucagon in large doses, and bleeding can occur.

#### Mechanism:

Unknown. Changes in the production of blood clotting factors and an increase in the affinity of warfarin for its site of action have been proposed. A study in guinea pigs using acenocoumarol suggested that changes in warfarin metabolism or its absorption from the gut are not responsible.



**Reference:** Stockley's, Karen Baxter, *Stockley's Drug Interactions*, 7th edition, Page 282, UK



## Ask the Expert

**Should I split the calcium dosage up throughout the day? Or should I take it all at once. Is there a difference?**



Yeah, there's a huge difference. Calcium is very hard to absorb into the gut. Because of this, no matter how much you might put in your stomach, you're only going to absorb about 500-600 mg at a time. The rest will be excreted in the urine. I get so annoyed at those commercials, while factually correct; say that such and such cereal gives you 100% of your daily calcium need. It does, but you can't benefit from it. Calcium supplements are absorbed best with food. We advise our patients to take one supplement with lunch and the other with either supper or a light snack at bedtime.

Usually people get their most dietary calcium at breakfast. It's also important to get 1000 IU of Vitamin D each day. Most calcium supplements have this added. Vitamin D is what sends calcium to the bones. Without it, your calcium intake will be mostly ineffective. Read the labels carefully. Calcium carbonate is usually one pill in a 600 mg dose. Calcium citrate is usually two pills in one dose. So look at the label to see what you're getting.

**Reference:** - <http://forums.webmd.com>



## Examples of Dose- Related Drug-Induced Hepatotoxicity

Drug	Toxic dose
<b>Paracetamol</b>	Single dose > 10g
<b>Tetracyclin</b>	>2g daily(oral) (increased risk of toxicity in pregnancy and renal failure)
<b>Methotrexate</b>	Weakly dose >15mg Cumulative dose >2g in 3years (increased risk of toxicity in pre-existing liver disease, alcohol, diabetes)
<b>6- Mercaptopurine</b>	>2.5mg/kg
<b>Vitamin A</b>	Chronic use of 40,000 units daily
<b>Cyclophosphamide</b>	Daily use > 400mg/m <sup>2</sup>
<b>Salicylates</b>	Chronic use >2g daily
<b>Anabolic Steroids</b>	High dose > 1 month
<b>Oral Contraceptive Steroids</b>	Increased risk with higher oestrogen content seen in earlier preparations Duration of treatment also a risk factor
<b>Iron</b>	Single dose > 1g

**Reference:** *Clinical Pharmacy and Therapeutics, third edition, page 195*

### Answers:

- 1- (D) The FDA recommended the removal of phenylpropranolamine from cough/cold products based on a retrospective study that associated use with a risk of hemorrhagic stroke.
- 2- (D) Zinc deficiency results in retardation of growth.
- 3- (A) Dysphasia is usually corrected by speech therapy.

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