



Glucocorticoid-Induced Osteoporosis

Even if you are taking a glucocorticoid medication for inflammatory arthritis or some other condition, there is no reason that you should face the added problem of osteoporosis. To protect yourself, become familiar with osteoporosis and start taking calcium and vitamin D supplements. Talk with your doctor about additional medication options to protect your bones.

Fast facts

- Anyone who is taking a glucocorticoid medication for more than 3 months is at risk for osteoporosis.
- A daily regimen of calcium and vitamin D supplements (by taking calcium supplements that have vitamin D added and one multivitamin per day) can help prevent problems. Calcium alone is ineffective.
- A rheumatologist can advise about other medication options.

What is glucocorticoid-induced osteoporosis?

Glucocorticoid-induced osteoporosis is a form of [osteoporosis](#) that is caused by taking glucocorticoid medications such as prednisone (*Deltasone*, *Orasone*, etc.), prednisolone (*Prelone*), dexamethasone (*Decadron*, *Hexadrol*), and cortisone (*Cortone Acetate*). These medications frequently are used to help control many rheumatic diseases, including [rheumatoid arthritis](#), [lupus](#), myositis and [polymyalgia rheumatica](#).

What causes glucocorticoid-induced osteoporosis?

Glucocorticoid medications have both direct and indirect effects on bone tissue that leads to bone loss. These medications have a direct negative effect on bone cells, resulting in a reduced rate of bone formation. In addition, they can interfere with the body's handling of calcium and affect levels of sex hormones, leading to increased bone loss.

Anyone who is taking glucocorticoid medications and has other risk factors for [osteoporosis](#) is at especially high risk for developing glucocorticoid-induced osteoporosis and suffering a fracture. Major risk factors for osteoporosis are:



- Older age (starting in the mid-30s but accelerating with advancing age)
- Non-Hispanic white and Asian ethnic background
- Small bone structure
- Family history of [osteoporosis](#) or osteoporosis-related fracture in a parent or sibling
- Previous fracture following a low-level trauma, especially after age 50
- Sex hormone deficiency, particularly estrogen deficiency, both in women (e.g., menopause) and men.
- Anorexia nervosa
- Cigarette smoking
- Alcohol abuse
- Low dietary intake or absorption of calcium and vitamin D
- Sedentary lifestyle or immobility
- Medications: excess thyroid hormone replacement; the blood thinner heparin (*Calciparine*, *Liquaemin*, etc.); certain anti-convulsant medications such as phenytoin (*Dilantin*), etc.
- Certain diseases that affect bone, such as endocrine disorders (hyperthyroidism, hyperparathyroidism, Cushing's disease, etc.) and inflammatory arthritis ([rheumatoid arthritis](#), ankylosing [spondylitis](#), etc.).

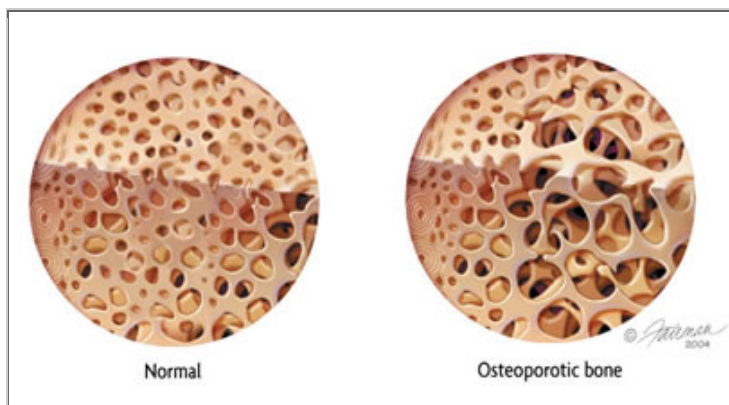
Who gets glucocorticoid-induced osteoporosis?

Anyone who needs to take glucocorticoid medications for more than 3 months is at risk of developing [osteoporosis](#) and fractures.

How is glucocorticoid-induced osteoporosis diagnosed?

A simple test that measures the bone mineral density (BMD) at different parts of your body, such as your spine and your hip, can help determine if you have osteoporosis. Dual energy X-ray absorptiometry (DXA) is the best current test to measure BMD. The test is quick and painless. It is similar to having an X-ray taken, but uses much less radiation. Even so, pregnant women should not have this test done to avoid any risk of harming the developing fetus.

The results of the DXA test are scored in comparison to the BMD of young, healthy individuals, resulting in a measurement called a T-score. Your bone density is considered normal if the T-score is between 1.0 and -1.0. If your T-score is -2.5 or lower, you are considered to have osteoporosis and at high risk for a fracture. T-scores between -1.0 and -2.5 are generally considered to show osteopenia. The risk of fractures is generally lower in people with osteopenia when compared with those with [osteoporosis](#), but if bone loss continues, the risk for fracture increases. However, people taking glucocorticoids appear to be at an increased risk for fracture at higher bone densities than would be expected.



Osteoporosis is a condition of weak bone caused by a loss of bone mass as well as a change in bone structure. The first picture is normal bone and the second shows osteoporotic bone.

How is glucocorticoid-induced osteoporosis treated?

Anyone taking glucocorticoid medication, especially for more than 3 months, must take, at a minimum, 1000 to 1200 milligrams (mg) of calcium and 400 to 1000 IU of vitamin D supplements on a daily basis. These supplements are useful in the management of glucocorticoid-induced osteoporosis. Your doctor may also measure the vitamin D level in your blood to determine if you need more vitamin D supplementation. Several medications are available to treat osteoporosis (see “How it’s treated” in the patient information

about [osteoporosis](#)) including glucocorticoid-induced osteoporosis. The decision to start additional medications will depend on your other risk factors, including your bone mineral density results. The bisphosphonates, alendronate (*Fosamax*), risedronate (*Actonel*), and zoledronic acid (*Reclast*) are FDA approved for the prevention and treatment of glucocorticoid-induced osteoporosis. For women who are considering a future pregnancy, talk to your doctor about the pros and cons of using a bisphosphonate (see additional information on pregnancy and bisphosphonates under “How it’s treated” in the patient information about [osteoporosis](#)). Teriparatide (*Forsteo*) also has been FDA approved for treatment of glucocorticoid-induced osteoporosis.

Prevention

If you take glucocorticoid medications for more than a couple of weeks, you should start taking calcium and vitamin D supplements at the doses recommended above. Whenever possible, the dose and duration of glucocorticoid medication use should be minimized if it is possible for your doctor to do so while keeping your disease under control. Other modifiable risk factors for osteoporosis should be minimized, especially smoking. Weight-bearing physical activity is encouraged. (See “Prevention” in the patient information about [osteoporosis](#).) It also is important to help prevent falls or other trauma, which increase the risk for fractures (See “Living with osteoporosis” in the patient information about [osteoporosis](#).)

Bone mineral density testing is recommended for those likely to remain on long-term glucocorticoid medications.

Broader health impact of glucocorticoid-induced osteoporosis

The most health-threatening consequence of glucocorticoid-induced osteoporosis is a fracture. Spine and hip fractures especially can lead to chronic pain, long-term disability and even death. The major goal in the management of glucocorticoid-induced osteoporosis is the prevention of fractures.



Points to remember

- A bone density test can safely measure changes in bone density during glucocorticoid treatment.
- Bone loss from glucocorticoid treatment can be decreased by using calcium and vitamin D supplements.

The rheumatologist's role in the treatment of glucocorticoid-induced osteoporosis

As specialists in musculoskeletal diseases, rheumatologists can help to determine the cause of [osteoporosis](#). They can provide and monitor the best treatments for this condition.

To find a rheumatologist

For a listing of rheumatologists in your area, [click here](#).

Learn more about [rheumatologists](#) and [rheumatology health professionals](#).

For more information

The American College of Rheumatology has compiled this list to give you a starting point for your own additional research. The ACR does not endorse or maintain these Web sites, and is not responsible for any information or claims provided on them. It is always best to talk with your rheumatologist for more information and before making any decisions about your care.

National Osteoporosis Foundation

www.nof.org

National Institute of Health Osteoporosis and Related Bone Diseases Resource Center

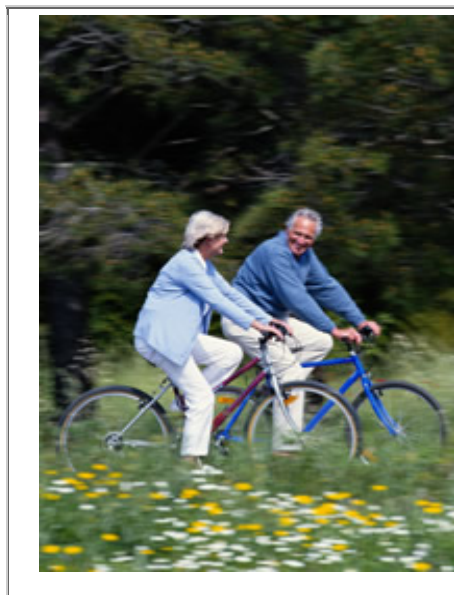
www.osteoporosis.nih.gov

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Written by Shreyasee Amin, MD CM, MPH, and reviewed by the American College of Rheumatology Patient Education Task Force.

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Regular weight-bearing exercise is an important part of prevention.