



# Hughston Health Alert

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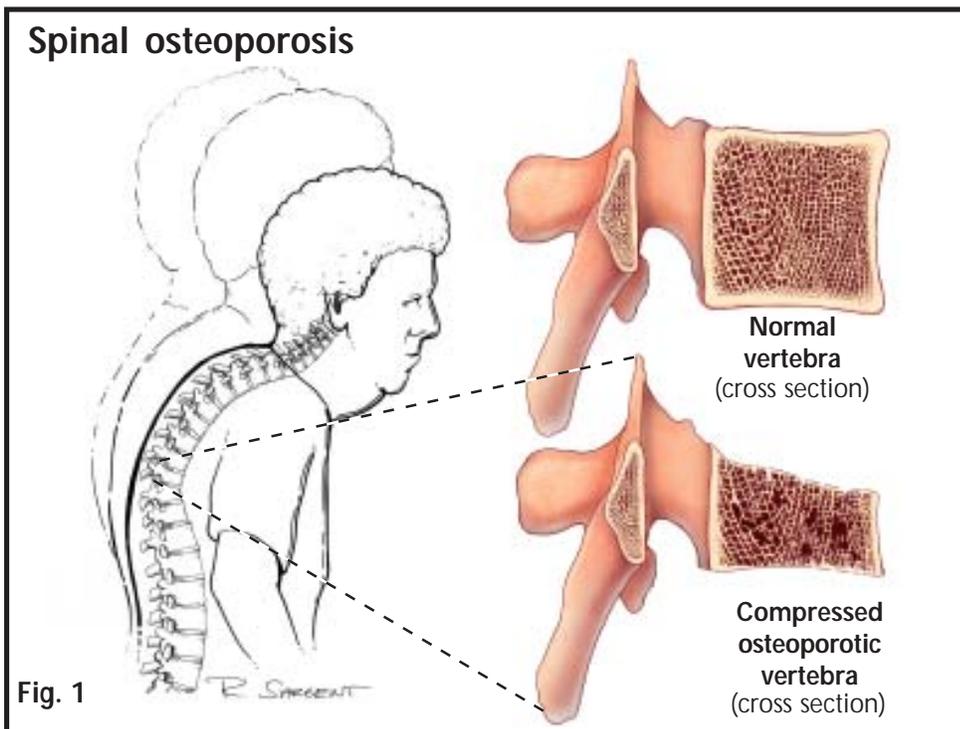
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SUMMER, 2002

## What is Osteoporosis?

Each year thousands of middle-aged and elderly Americans experience a sudden, unexpected bone fracture. Often the underlying cause of the fracture is a disease called osteoporosis. A major health problem, osteoporosis reduces bone mass causing bones to become thin and fragile and more likely to break.

If left untreated, osteoporosis can become a debilitating disease. For example, lifting or bending to pick up a heavy object can cause a spinal fracture. In fact, the bone can become so thin that a person can fracture the spine simply by carrying his or her own weight (Fig. 1). These types of fractures usually occur in the hip, spine, and wrist, but osteoporosis



### Inside This Issue:

#### Osteoporosis

- How Do I Know If I have Osteoporosis?
- What Can Be Done About Osteoporosis?
- The Female Athlete Triad
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affects all bone in the skeletal system, placing it at a higher risk of fracture.

#### What causes osteoporosis?

As part of the natural aging process your bones become weaker and less dense. Bone is living tissue that provides structural support for muscles, protects vital organs, and stores much needed calcium. Diet, exercise, and your overall lifestyle affect bone growth and a bone's ability to heal. You build and store bone efficiently until around age 30, then as you age your bones begin to break down faster than new bone can

be formed. Therefore, the older you are, the greater your risk of osteoporosis.

Calcium is an important mineral nutrient for bone formation, but it also helps muscle contraction, blood clotting, and nerve functions. Most of your calcium supply is stored in your bones; however, if the body does not take in enough calcium, it will draw its supply from the bone. Calcium alone cannot prevent or cure osteoporosis, but a history of low calcium intake can put you at an increased risk for osteoporosis.

Bone mass is directly affected by a

**FOR A HEALTHIER LIFESTYLE**

decrease in the female hormone estrogen. In women, bone loss accelerates after menopause when your ovaries stop producing estrogen. An estrogen deficiency can occur after natural menopause or after the surgical removal of both ovaries. An estrogen imbalance can also be found in women with eating disorders and in women who do not have a regular menstrual cycle (Fig. 2).

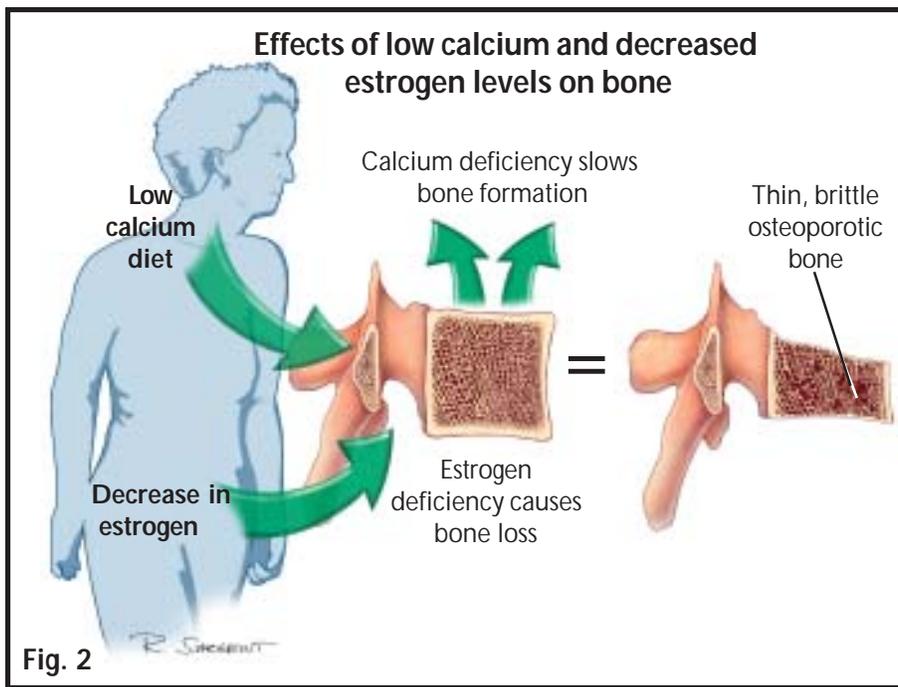


Fig. 2

Often, estrogen replacement therapy is prescribed to prevent or reduce bone loss. Men also experience similar bone loss if the male hormone testosterone becomes deficient.

A major cause of osteoporosis is the lack of accumulated bone density before age 30. Therefore, less bone is available when bone begins to break down faster than it is formed. For young adults, especially women, building bone mass is a critical factor in protecting yourself against osteoporosis.

### Are you at risk?

Your chances of developing osteoporosis are greater if you answer yes to any of the following questions:

- Are you a woman? Women usually have less bone tissue and lose bone more rapidly than men, putting them at a higher risk for osteoporosis.
- Are you thin or do you have a small frame? If so, you tend to have more fragile bones.
- Are you Caucasian or Asian? If so, your risk is higher, although African Americans and Hispanic Americans are also at risk.
- Are you aged 50 or older? Your

bones become weaker and less dense as you age.

- Do you have a family history of osteoporosis or are you susceptible to fracture? If so, it may be hereditary. Often, young women whose mothers had vertebral fractures also have reduced bone mass.

- Does your body no longer produce the hormone estrogen? If you are postmenopausal; if you stop menstruating because of conditions such as anorexia or bulimia (eating disorders) or because of excessive physical exercise; or if you experience an abnormal absence of your menstrual cycle, you are at a greater risk for osteoporosis.

- Is your diet low in calcium?
- Do you use certain medications, such as corticosteroids and anticonvulsants; medications to treat disorders such as rheumatoid arthritis, endocrine disorders (underactive thyroid), seizure disorders, and gastrointestinal diseases? If so, you may experience side effects that can damage bone and lead to osteoporosis.

- Are you a man with low

testosterone levels?

- Do you smoke cigarettes, use alcohol excessively, or get little or no weight-bearing exercise? If so, you increase your chances of developing osteoporosis.

### Can osteoporosis be prevented?

Building strong bones during childhood and adolescence can be the best defense against developing osteoporosis later. However, despite your age, you can take action now to prevent

or slow the effects of osteoporosis.

One action alone is not enough to prevent or slow osteoporosis, but applying all of these principles may. You should eat a balanced diet that is rich in calcium and vitamin D. You should regularly participate in a weight-bearing exercise program, and live a healthy lifestyle that includes no smoking or excessive alcohol intake. And if you become at risk for osteoporosis, you should have a bone density test and take any prescribed medication necessary. Together, these practices will not only help you prevent osteoporosis, they will help you live a happier, healthier life.

*John M. Henderson, DO, FAAFP  
Columbus, Georgia*

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# How Do I Know If I Have Osteoporosis?

## Testing for bone loss

Osteoporosis is diagnosed by measuring bone density. If you are over age 65, if you are a postmenopausal woman who has had a bone fracture, if you are a woman on prolonged hormone replacement therapy, if you are anorexic (eating disorder) or do not have a monthly menstrual cycle, or if you take steroids for any illness, you should have a bone density test. Ideally, you should measure your bone mass and begin prevention techniques or treatment to stop bone loss before bone density has decreased to the point where fractures occur. Early testing can mean the difference between a prevention program, such as taking calcium supplements with vitamin D, and a treatment program such as hormone replacement therapy. While you are at your doctor's office, you may have an x-ray to determine bone density or your doctor may recommend a testing facility. Testing is often done at a diagnostic outpatient facility or at a hospital.

### What tests are available?

There are several types of noninvasive, painless tests available to

measure bone mineral density. These tests are used not only to diagnose osteoporosis but also to follow the effectiveness of treatment. The test can measure bone density in your spine, hip, or wrist—the most common areas for fractures from osteoporosis. Once your bone density is known, it is compared against two standards, known as the age-match reading and the young-normal reading. The age-match reading compares your bone density to what is expected in someone of your age, sex, and size. The young-normal reading compares your density to the optimal peak bone density of a healthy young adult of the same sex and size. Using these comparisons, your doctor can determine whether you are at risk for a fracture and what action should be taken to avoid osteoporosis-related fractures.

The most common testing method in use today is Dual-Energy X-ray Absorptiometry (DEXA), also known as a Dual X-ray Absorptiometry (DXA) scan (Fig.). This test has very little radiation; it is precise; and it can measure the bone density of the spine, hips, or the entire body. The test is simple and takes only a few minutes. It is fairly expensive, however, averaging about \$300.

Radiographic Absorptiometry (RA) is less expensive and more mobile, but it only uses an x-ray of the hand to calculate bone density. The Quantitative Computed Tomography (QCT) is most often used to measure the spine but it can also measure other sites. The QCT is also sensitive to early

bone loss. Unfortunately, it has a high radiation level and limited access. Other less frequently used screening tests include the Single X-ray Absorptiometry (SXA), which measures the wrist or heel, and the Quantitative Ultrasound (QUS), which uses sound waves to measure the spine and other sites. Peripheral screening tests, such as the pDEXA and Peripheral Ultrasound that measure the wrist and heel, have a limited screening area and are less sensitive; however, they are also less expensive and more mobile, which makes them more accessible.

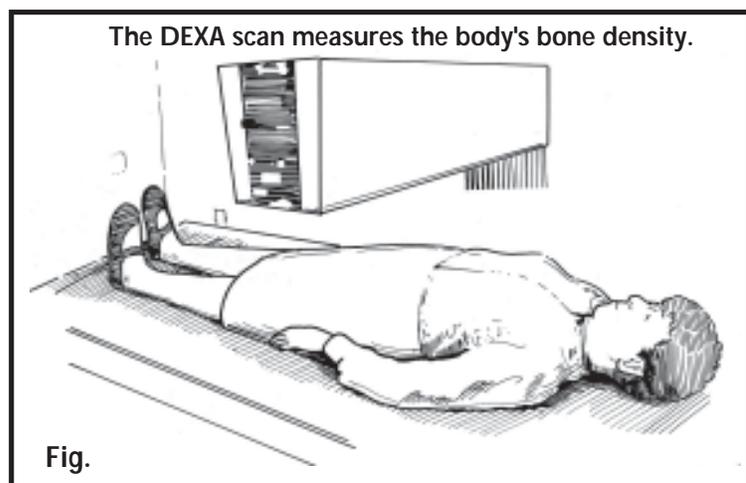
Conventional x-ray can be used for screening, but it is subject to some significant limitations. An x-ray does not show bone loss until as much as 25% of your bone is gone and an x-ray is technique dependent. For example, if the x-ray taken is not of good quality, the doctor may not be able to tell for certain if osteopenia (thinning of the bone from age) or osteoporosis is present.

Bone density testing is recommended for all women over the age of 65, but you may want to be tested earlier if you are postmenopausal or have other risk factors for osteoporosis. Men should also be screened if they have any risk factors. Typically, scans are performed every 2 years. Testing more frequently is usually not helpful because the rate of bone loss or gain is so slow that it takes at least 1 year to see any results or changes.

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# What Can Be Done About Osteoporosis?

## Prevention and treatment

Osteoporosis is a skeletal disease characterized by severe bone loss, and is a common cause of fractures (broken bones), especially in women who are beyond menopause. However, by strengthening your bones, slowing bone loss, and avoiding falls, you can help prevent or treat the condition and avoid fractures.

## Diet

Prevention and treatment of osteoporosis begins with proper diet. Ensuring that you get enough calcium and vitamin D each day is a great start. Calcium helps your body build bone, and vitamin D helps your body absorb calcium. Calcium can be found in dairy products (e.g., milk, cheese, yogurt, and ice cream); in salmon and sardines with bones; in dark green leafy vegetables (e.g., kale and broccoli); and in food with added calcium, such as orange juice. The National Osteoporosis Foundation recommends the following calcium intake each day:

- 800 mg for children ages 1-11
- 1200 mg for ages 11-24
- 1000 mg for adults
- 1200 mg for pregnant and lactating women
- 1500 mg for postmenopausal women not on estrogen.

Supplements can provide needed calcium. If you need to take a supplement, choose it carefully. Avoid bone meal and dolomite supplements because they may contain lead.

You need at least 400 international units (IU) of vitamin D each day. You can get your daily requirement by taking a multivitamin; getting 30 to 60 minutes of sun exposure, or

consuming foods that contain vitamin D, such as fortified milk (a 1-cup serving contains 100 IU) or salmon (a 3-ounce serving contains 425 IU). Although vitamin D in adequate amounts helps your body absorb calcium, it is harmful if taken in excessive amounts. Most people should avoid taking more than 800 IU a day.

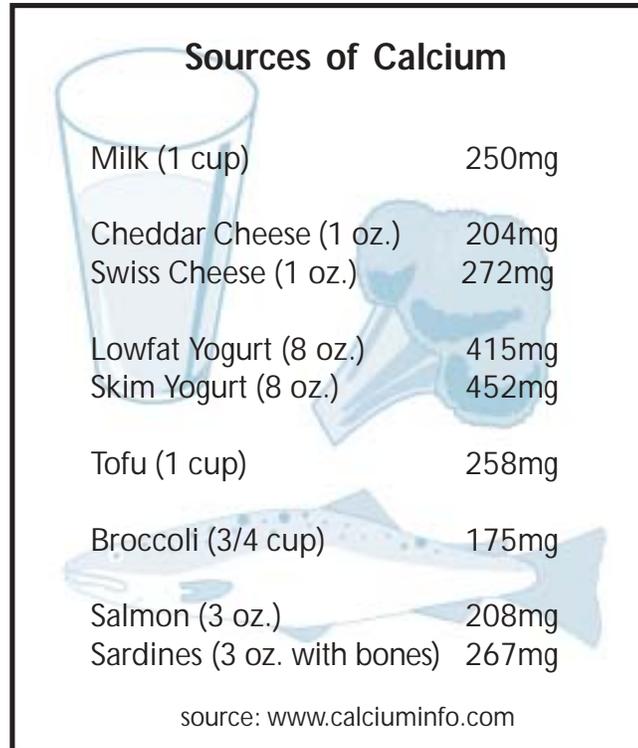
week. Remember to talk with your doctor before starting any exercise program. Your health care professional can help you create a program that fits your needs and abilities.

## Medication

Your doctor may prescribe various medications that help slow the loss of bone mass so your body can build new bone as old bone is lost. Currently, the US Food and Drug Administration has approved estrogen, alendronate, raloxifene, risenedronate, and calcitonin to help in the treatment of osteoporosis.

Hormone replacement therapy for the replacement of estrogen is one of the most valuable options for women who are candidates for such medication. In addition to the treatment of bone loss, the benefits of this therapy includes a reduction in the risk of heart disease and in the symptoms of menopause. Unfortunately, some women cannot or will not take estrogen because of side effects (e.g., breast tenderness,

slight bloating, and vaginal bleeding), certain risk factors (e.g., endometrial [lining of the uterus], breast, or uterine cancer), or other associated problems (e.g., uncontrolled hypertension, impaired liver function, or porphyria). Some women may not be able to take estrogen if they have problematic diabetes, gallbladder disease, migraine headaches, pancreatitis, high triglyceride levels, or endometriosis. However, these women may be able to take other medications, such as alendronate (Fosamax), calcitonin, or calcium plus vitamin D. Talk with your doctor to find out which is best for you.



Milk (1 cup)	250mg
Cheddar Cheese (1 oz.)	204mg
Swiss Cheese (1 oz.)	272mg
Lowfat Yogurt (8 oz.)	415mg
Skim Yogurt (8 oz.)	452mg
Tofu (1 cup)	258mg
Broccoli (3/4 cup)	175mg
Salmon (3 oz.)	208mg
Sardines (3 oz. with bones)	267mg

source: [www.calciuminfo.com](http://www.calciuminfo.com)

## Exercise

You can help reduce the risk of developing osteoporosis by exercising regularly. Furthermore, exercise, as part of the treatment for osteoporosis, stabilizes bone density and helps reduce the risk of bone fracture. Your regular exercise program should include weight-bearing and resistance exercises that strengthen bones and muscles. Weight-bearing exercises include activities such as walking, jogging, dancing, hiking, and housework. Resistance exercises include weight training and pushups. You should participate in an exercise program three to five times each

## Home safety

Falls often lead to fractures in people with osteoporosis. To prevent falls, create a safe home. Remove or anchor rugs and furniture that can cause you to trip. Install night-lights and grip-bars in your bathroom, and use a rubber mat in the bottom of your bathtub. Keep regularly used items at a height you can reach easily without a stool. Make sure that the rooms in your home are well lit.

## Screenings and lifestyle changes

By age 30, you and your doctor should discuss your risk of developing osteoporosis. Regular osteoporosis screenings that may include a bone density test should begin for women by age 65 and for men by age 75. Younger men and women should have these regular screenings if they have any of the following risk factors: alcoholism, heavy tobacco use, or have an associated disease (e.g., hyperparathyroidism [excessive parathyroid hormone], disease treated with steroids, glandular disease, or advanced kidney or liver disease.)

In addition to checkups, you can help prevent osteoporosis by making some lifestyle changes. Stop smoking and decrease your alcohol intake. Increase your physical activity level and improve your diet.

Prevention of osteoporosis is obviously preferred to treatment, but adequate treatment can reduce the risk of fracture, increase bone mass, improve mobility, and reduce pain. Both men and women should be concerned about osteoporosis and should not wait until signs and symptoms appear before taking action. Education, wise lifestyle choices, and regular screenings can reduce the likelihood that the disease will affect your quality of life.

*Clark H. Cobb, MD  
Columbus, Georgia*

## The Female Athlete Triad

Osteoporosis is a disease that causes bones to become weak and brittle. Normally, you would not associate weak and brittle bones with an athlete, however, osteoporosis can develop in female athletes with inadequate nutrition. The symptoms of osteoporosis are often hard to recognize, and many athletes do not know they have it until another condition, such as a stress fracture, severe back pain, or lack of menstrual periods, forces them to visit their doctor.

To understand the cause of osteoporosis, you have to examine the way the body maintains the skeletal system. As with all other cells of the body, old bone cells are removed and replaced with new bone cells. During the developmental years, new bone cells are added faster than old bone cells are removed. This exchange allows our skeletal system to grow and to become stronger, and it creates the bone density that will be needed later in life. After the age of 30, when bone density reaches its peak, the old bone cells are removed faster than the new bone cells are replaced. Therefore, the higher the bone mass at age 30, the less chance there is of osteoporosis developing.

During bone development, a female athlete can be especially vulnerable to developing osteoporosis because of a condition known as the **female athlete triad**. The triad is a triangle of events that can start with an eating disorder or excessive exercise, or both, which in turn cause amenorrhea—the lack of a menstrual period or an abnormal menstrual cycle—which then causes a reduction in estrogen levels that eventually leads to bone loss.

Concerns with body weight can lead many young women athletes to diet excessively, causing calcium and vitamin D to be eliminated from the diet. Disordered eating is most commonly found among participants in sports, such as gymnastics, ballet, figure skating, equestrian sports, and diving, in which the athlete is judged on appearance as well as on performance. However, eating disorders are also found among athletes who participate in swimming, tennis, and running—sports in which the athlete's appearance is not judged. Sometimes, an athlete's fear of being fat leads to eating disorders that range from moderate food restriction to occasional bingeing and purging to dangerous levels of severe food restriction. Unfortunately, there have been reports of 19-year-old female athletes who have the bone mass of an 80-year-old woman as a result of the female athlete triad. Friends, parents, coaches, athletic trainers, and physicians should be alert to an athlete's eating behaviors. Eating alone, trips to the bathroom during or right after a meal, and the frequent use of laxatives should be cause for concern.

The benefits of sport far outweigh the risk, but consequences of the female athlete triad can be irreversible bone loss, disorders related to starvation, decrease in estrogen levels, and premature death. The best treatment plan for osteoporosis in athletes is one that is developed by a physician after the proper assessment has been made.

*Bruce Getz, ATC  
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## Test Your Osteoporosis IQ

### True or false?

#### Osteoporosis is a “woman’s disease.”

False. Although women are more likely to develop osteoporosis, men who have taken steroids, have abused alcohol, or have reduced testosterone levels may be at risk. According to the National Institutes of Health, 1 in 8 men and half of all women over the age of 50 will experience an osteoporosis related fracture. Approximately 28 million people are currently coping with osteoporosis.

#### Osteoporosis is a normal part of aging.

False. All men and women lose bone mass as they age, but not everyone has osteoporosis. Osteoporosis is a disease characterized by an excessive decrease in bone mass that leads to an increased susceptibility to fracture. Although most individuals lose bone mass as they age, the remaining bone is usually strong enough to support the stress of daily activities and is healthy and capable of repair after fracture. Osteoporosis, however, weakens the bones to a point that a bump or a fall can cause a painful fracture of the hip, spine, or other bones.

#### Osteoporosis can be life threatening.

True. According to the National Osteoporosis Foundation, a woman’s risk of hip fracture is equal to her combined risk of breast, uterine, and ovarian cancer. In 1991, approximately 300,000 Americans were admitted to hospitals with hip fractures, and an average of 24% of

hip fracture patients aged 50 and over died in the year following their fracture. Frail bones caused by osteoporosis were considered the underlying cause for most of these hip fractures.

Osteoporosis can affect any bone, but fractures of the hip cause special concern. A hip fracture usually requires hospitalization and often major surgery. The fracture can impair a person’s ability to walk, may cause prolonged disability, and could even cause death. Often, older patients who are hospitalized for a hip fracture cannot return home or live independently after the injury.

#### I drink milk and take vitamins; I have nothing to worry about.

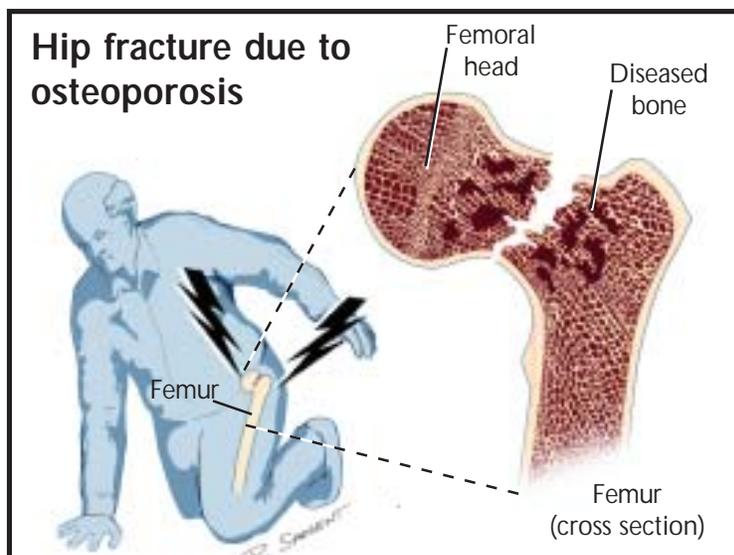
False. Although adequate nutrition is considered an important step to prevent osteoporosis, it is not the only factor. Four preventive measures act in combination to prevent osteoporosis and are crucial for building optimal bone mass during youth.

- A balanced diet rich in calcium and vitamin D
- Weight-bearing exercises
- No smoking and limited alcohol intake
- Bone density testing and medication, when appropriate

#### There is no satisfactory treatment for osteoporosis and no hope for a cure.

False. There are several factors that can prevent, slow, and possibly stop the progress of osteoporosis. Proper nutrition, especially adequate calcium

and vitamin D, weight-bearing exercise, and in some cases, medication can slow the effects of osteoporosis. Currently, estrogen, alendronate, raloxifene, risedronate, and calcitonin are approved by the US Food and Drug Administration (FDA) for the prevention or treatment of postmenopausal osteoporosis. Medical experts agree that osteoporosis is highly preventable and with continuing research the future for a definitive treatment is likely. As with any condition, early diagnosis is the key to the most successful outcomes.



Currently, physicians at The Hughston Clinic in Columbus, GA are conducting a clinical research study to test the effectiveness of a new drug to prevent hip fractures.

For additional information regarding osteoporosis contact the National Institutes of Health, Osteoporosis and Related Bone Diseases – National Resource Center (phone 800-624-BONE, website [www.osteoporosis.org](http://www.osteoporosis.org)) or the National Osteoporosis Foundation (phone 202-223-2226, or visit their web site at [www.nof.org](http://www.nof.org)).

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# Water Works

## Aquatic therapy for osteoporosis

Low bone mass and osteoporosis affect approximately 44 million American men and women over the age of 50. Ten million individuals are estimated to already have the disease and almost 34 million more are estimated to have low bone mass.<sup>1</sup> The term osteoporosis simply means "porous bone" and is characterized by a decrease in bone mass and a deterioration of bone tissue that leads to fragile bones and the risk of fractures. Often, this disease goes undetected until a simple bump, fall, handshake, or, even worse, a hug from a loved one causes a broken bone.

One of the most important things you can do to prevent or reduce the effects of osteoporosis is to maintain a regular exercise routine. Weight-bearing activities, such as walking or jogging, and resistance exercise, build muscle strength as well as

improve your balance and body awareness, thereby reducing your risk of falls. Unfortunately, if a loving hug can break a rib, imagine how terrifying it must be to attempt an exercise routine. This is where aquatic therapy can help.

Water serves as a safety net for individuals with osteoporosis. Physical therapy in a swimming pool provides a safe place for you to exercise without putting yourself at risk for falls or broken bones. Aquatic therapy increases muscle strength, decreases pain by reducing weight-bearing forces to joints and bones, improves balance, speeds the rate of recovery, and increases proprioception (your body's ability to sense muscle and joint positioning). Aquatic therapy can help you relax and improve your circulation, range of motion, muscle tone, and self confidence. Half the battle of reducing falls is eliminating the fear. Aquatic exercise can do just that.

The aquatic exercises illustrated below can help you improve your strength, balance, and coordination.

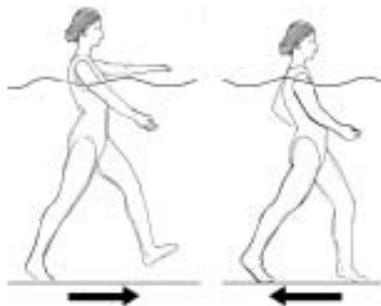
Aquatic therapy can complicate rather than complement certain conditions. So, before you begin any exercise program, first discuss the program with your doctor or other health care professional.

Shannon B. Lucas, PTA  
Columbus, Georgia

### References:

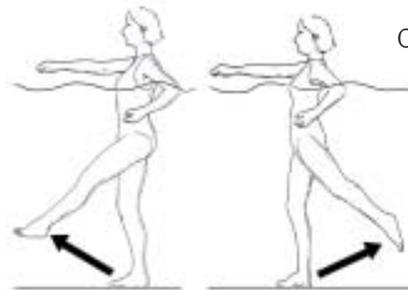
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## Aquatic Exercises

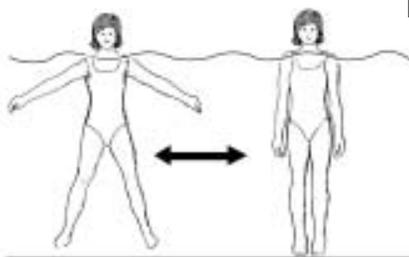


- A. Walk forward and then backward the length of the pool (use handrail for balance if necessary).

Keep hips and toes facing forward.

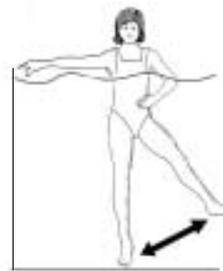


- C. Stand sideways to the pool with feet together. Use handrail for balance. Keeping knee straight, slowly raise your leg toward the surface. Hold and slowly return to starting position.



- B. Face the pool wall and place hands on handrail. Walk sideways down the length of the pool.

Keep hips in line with each other. Keep knees and toes facing straight toward the wall.



- D. Stand against the pool wall with feet together. Slowly raise one leg out to the side. Hold and slowly lower leg to starting position. Repeat on opposite leg.

Keep knees and toes facing straight ahead.

**John M. Henderson, DO, FAAFP**, graduated from Duquesne University in Pittsburgh, Pennsylvania, and the Physician Assistant Program at Hahnemann Medical College in Philadelphia. He earned his Doctor of Osteopathy degree at West Virginia School of Osteopathic Medicine. He completed an internship at Tripler Army Medicine Center and a residency at Womack Army Community Hospital. He completed a sports medicine fellowship at The Hughston Clinic before joining the staff in 1989.



Dr. Henderson is certified by the American Board of Family Practice and holds a certificate of Added Qualifications in sports medicine. He is a founding member of the American Medical Society for Sports Medicine and is a fellow of the American Academy of Family Physicians, the American College of Sports Medicine, and the Society of Professional Team Physicians. He is an assistant professor in the Department of Family Medicine at Mercer University School of Medicine, and West Virginia School of Osteopathic Medicine.

Dr. Henderson is a lieutenant colonel in the US Army Reserve and served in Operation Desert Shield and Operation Desert Storm as a brigade surgeon. He is the Director of the Sports Medicine Fellowship for Primary Care Physicians at the Hughston Sports Medicine Center and the medical director of the Rehabilitation Unit of the Hughston Hospital. He practices at the Hughston-St. Francis I Clinic, 2300 Manchester Expressway, Building G. For an appointment call (706) 323-5717.

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## Health Hint

### Is your body absorbing the calcium it needs?

For calcium to be absorbed properly and used effectively by the body (including the bones), you need Vitamin D. The United States Food and Drug Administration's Recommended Daily Allowance for vitamin D is 400 international units (an eight-ounce glass of milk has 100 IU). Talk to your doctor about your calcium absorption and how vitamin D may help.



## Hughston Health Alert

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