Hughston Health Alert

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Inside...

Osteoporosis

Like many patients, you may have questions about osteoporosis after receiving the diagnosis from your doctor. You may not understand exactly what it is or how you got it. You may not understand how your medication works or why you take a pill once a week but your friend takes a pill once a month. You may wonder how long you have to take the medication and if there is anything else you can do to improve the strength of your bones.

What is osteoporosis?

Osteoporosis is a disease of the skeleton that is characterized by low bone-mineral density causing your bones to become thin, porous, and fragile. If your bone density drops too low, you are at greater risk of fractures, or broken bones. It often affects you as you age, and it is one of the leading causes of fractures in people over 50 years old (Fig. 1). It can affect both men and women; however, you are at a higher risk for osteoporosis if you are female, have had your ovaries removed, or if you have a low body weight. If you have a family history of osteoporosis, or a medical condition that causes osteoporosis, it is important to see your doctor to determine if you should be tested for brittle bones.

Fractures of fragile bones put thousands of people in the hospital every year and cause many of them to need surgery. A broken hip can be a terrible injury for a patient and even with the best medical care it can lead to severe complications. Often, people who break their hip never return to an independent life

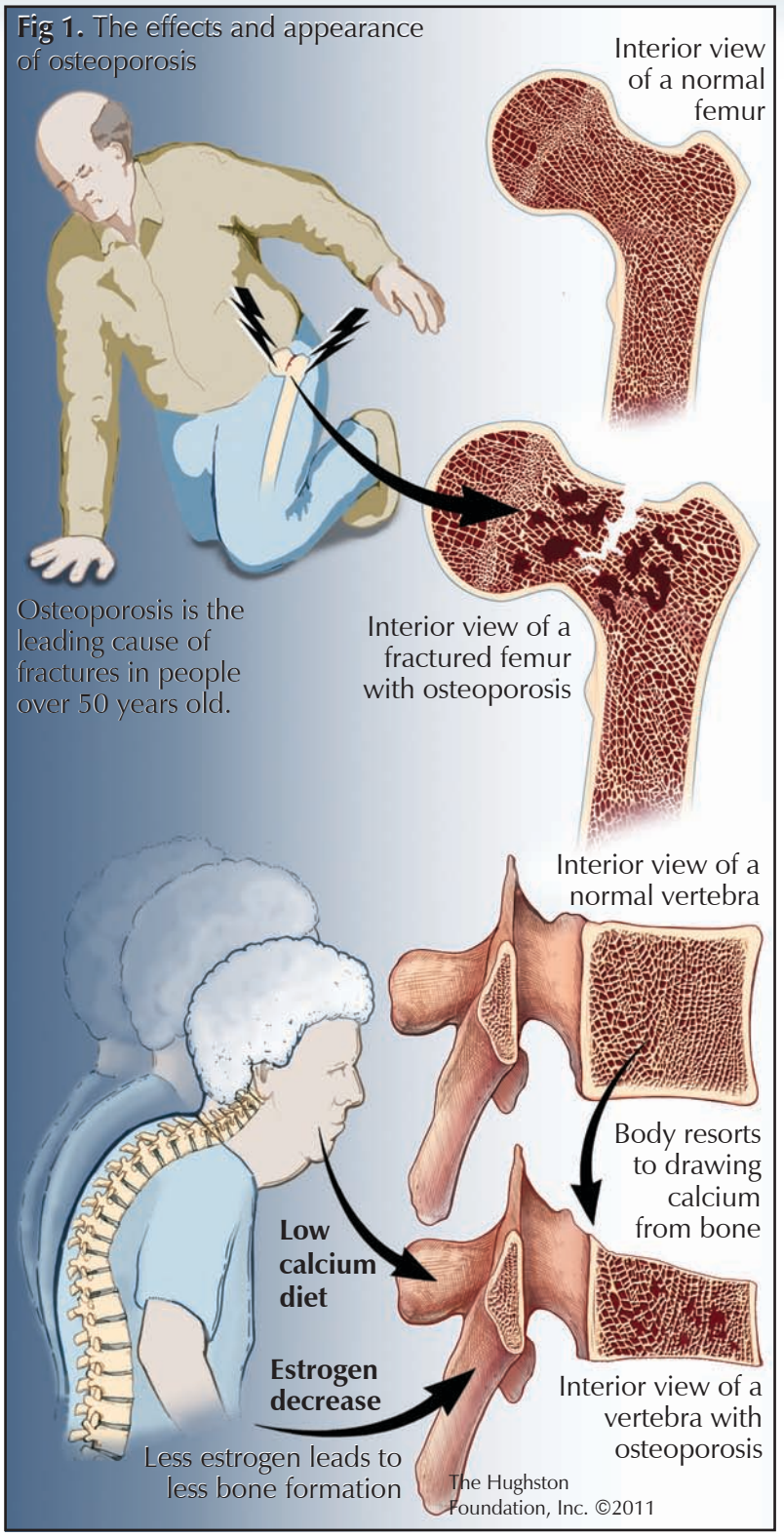

Fig 1. The effects and appearance of osteoporosis

and often end up leaving their home for an assisted-living facility. Fortunately with treatments available today, the rate of hip fractures has declined by almost 33% in the past 10 years.

The first step in preventing a fracture from osteoporosis is having your bone density measured using dual-energy x-ray absorptiometry (DEXA or DXA). The DEXA scan is a screening test that measures your bone density and compares it to your optimum bone density. Women who are 65 or older, men 70 or older, and anyone who has a family history of osteoporosis should be tested. Fortunately, if you are at risk of fracture, there are treatment options.

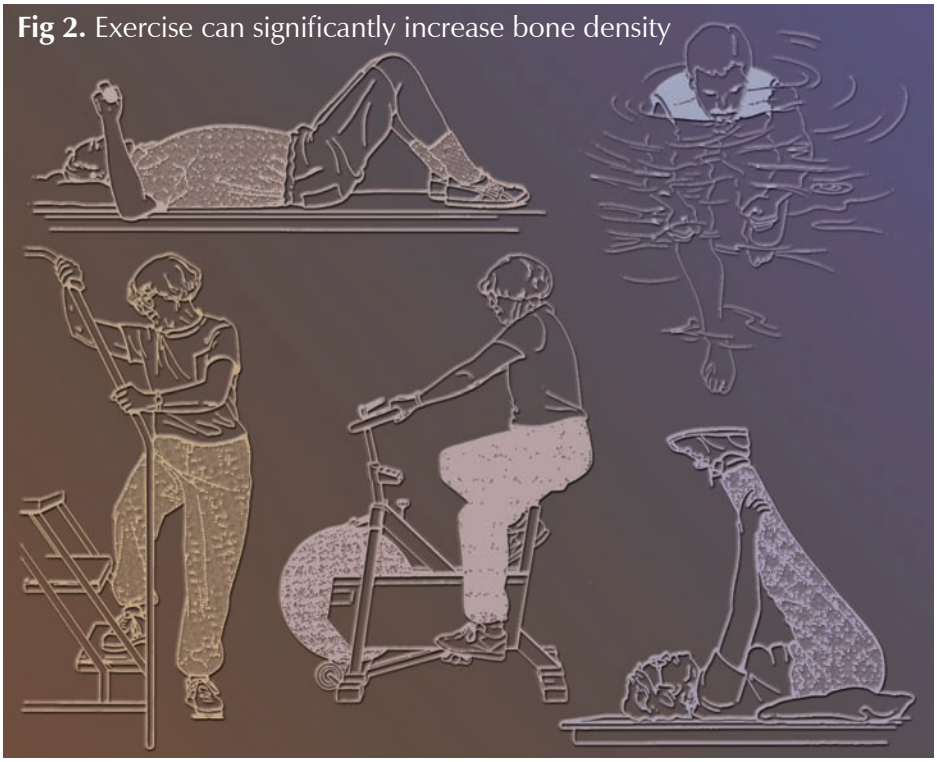

Fig 2. Exercise can significantly increase bone density

Can it be prevented?

For most people, your bone density is best when you are young and in your 20s. From that age on, it begins to decline. Two things that help to prevent osteoporosis later in life are having a high bone density when young, and having a slow rate of bone density loss as you grow older. In a young person, a proper diet high in calcium and vitamin D and plenty of sports and weight-bearing activity like running can help prevent low bone density later.

Likewise, exercise and diet are important for improving bone density as we age (Fig. 2). Exercise can significantly increase bone density in people over the age of 50—especially when combined with dietary supplements of vitamin D and calcium. Exercise levels must be appropriate for your age and physical condition. Weight lifting and aerobics may be best for younger individuals, while dancing, walking, swimming, and yoga can be enjoyed by those with lower exercise tolerance.

How is it treated?

Exercise and supplements of vitamin D and calcium can help patients who are at risk for osteoporosis; however, for those who have already had fractures due to low bone density, additional medications may be needed. The most commonly used medications to improve your bone density are called bisphosphonates, such as Fosamax®, Actonel®, Boniva®, and Reclast®, that slows the process by which your body breaks down bone. Some of the medications are taken once a week, while others, such as Boniva® are taken once a month, Reclast® is taken intravenously once a year. All have been shown to reduce fractures, with up to 70% reduction in hip fractures and 40% reduction in spine compression fractures.

Estrogen or estrogen-like medications can also improve your bone density. If you are taking a medication like Evista® already, it can have positive effects on your bones. Depending on your health and your family health history, your physician may not prescribe the medication because of its possible side effects on breast tissue and your heart.

A new drug recently released, called Prolia® has shown good results in preventing fractures. Prolia® is an antibody that targets the signaling molecules in your body and prevents them from causing bone breakdown. For patients who have had complications from the other medications, Prolia® is available as an injection that is given every 6 months.

Most studies show that taking the medications for up to 5 years is safe; although, they can have some negative effects beyond that time. Currently, some doctors recommend that patients take a "drug holiday" to allow their bones to have some time to remodel and grow normally without any interference. The time without the medication is meant to allow new bone to fully mature and to become as strong as possible naturally. Also, some recent studies have shown that taking the medications for over 10 years can have adverse effects on your bones.

Although women are at a higher risk for osteoporosis, men are not immune. Fortunately the same methods of screening and treatment are effective for both men and women. If you have more questions, or wonder if you or a loved one is at risk for osteoporosis, you should speak to your doctor about it. Your physician can tell you if you need testing or treatment.

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Caring for Your Fracture

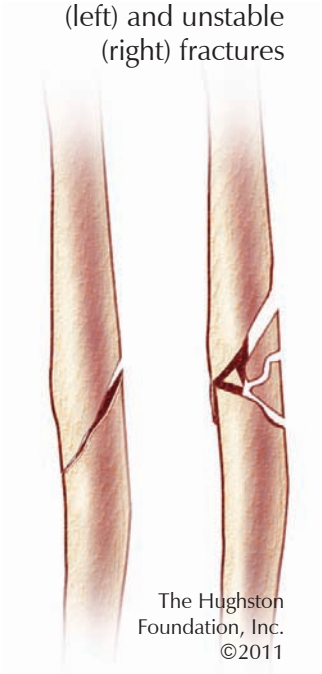
Fractures, or broken bones, are among the most common injuries seen in an orthopaedic clinic. Fractures can be caused by trauma, overuse, or bone disease such as osteoporosis (fragile bones). Treatments vary and include surgical and nonsurgical techniques that depend on which bone is fractured, your age, the severity of the fracture, and the demands of your lifestyle.

Diagnosis

After a fracture occurs, a physician should perform a medical evaluation that includes examining the injured area for swelling and assessing the circulation and nerve status. Then an x-ray is taken which can reveal the severity and location of the fracture and help confirm the diagnosis. Once the diagnosis is made, you should be referred to an orthopaedist who can help you decide on a treatment plan.

Fractures are often grouped into 2 main categories, stable and unstable (Fig. 1). A stable, nondisplaced fracture means that the bone breaks, but the pieces do not move apart from each other. Unstable fractures are fractures that are either significantly displaced or have a very high chance of displacing. A displaced fracture occurs when the bone breaks and the broken pieces move apart from each other. Often, unstable fractures require surgery to hold the fractured pieces together while healing occurs.

Fig. 1. Stable (left) and unstable (right) fractures



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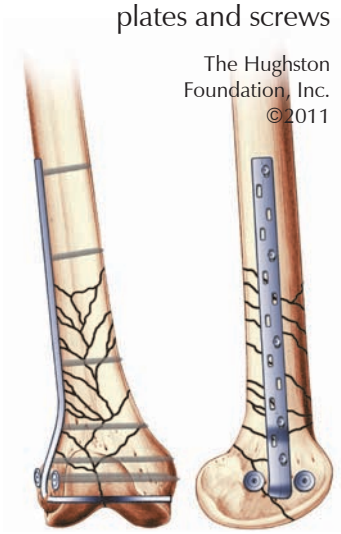
Treatment

Healing begins immediately after a fracture and continues through a fairly predictable course. Initially, internal bleeding occurs at the fracture site, and over the coming weeks, the blood is replaced with cartilage and then bone.

Often, initial treatment requires reduction, or putting the bones back in place, and then immobilizing the bones so that they do not move while the fracture heals. Most stable fractures are immobilized nonsurgically using casting, bracing, or slings. Immobilization of unstable fractures can be achieved surgically using pins, plates, screws, rods, and external fixators (Fig. 2). The time it takes a fracture to heal varies from 6 weeks to 6 months depending on the severity of the fracture, method of treatment used, and location of the fracture. Often, fractures heal without difficulty; but occasionally, fractures take longer to heal, or they may not heal at all. When a fracture does not heal, surgery is often needed to help stabilize the bones or bone grafts can be used to help improve healing.

Fig. 2. Unstable fractures immobilized with plates and screws



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Regardless of the method of treatment, fractures require special care after casting or surgery. Your orthopaedist can advise you on specific precautions you should take and how to use devises, such as removable casts and slings or crutches. Physical therapy is started at a safe time during healing to help keep muscles strong and keep joints from becoming stiff.

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Table 1. With nonsurgical fracture treatments

- Keep fractured extremity elevated for the first several days to reduce swelling. Keep the fracture at or just above the level of the heart.
- Keep your cast clean and dry. A wet cast can damage the skin under it and can become loose and ineffective.
- Immediately report severe pain or swelling after cast placement to your doctor. Severe swelling in the cast can cut off blood flow and cause serious damage to your limb.
- Wear your brace at all times unless your physician has told you to remove it while bathing or if your therapist has you remove it during supervised physical therapy.

Table 2. With surgically treated fractures

- Notify your physician immediately if you notice any foul smelling drainage or excessive drainage from your surgical sites.
- Elevate the injured limb as much as possible after surgery for several days to help reduce swelling.
- Clean your surgical incisions daily. Do not submerse surgical incisions in water until your doctor tells you it is okay. Instead, clean the incisions gently with soap and warm running water.
- Often, devices used in fracture surgery, such as pins, plates, and screws are left in the body after the fracture heals unless they cause pain or other problems.

Sickle Cell Trait in Sports

Fig 1. Types of red blood cells and blood flow

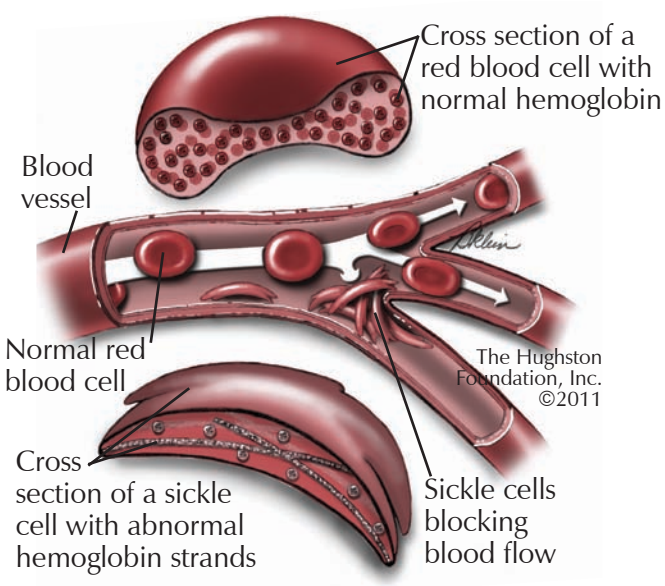
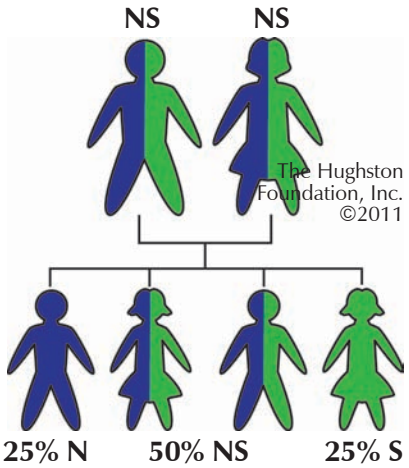


Fig 2. Chances of sickle cell trait being passed on



A hot topic in sports medicine today concerns the presence of sickle cell in athletes. Nationally publicized occurrences of sports injury and deaths related to sickle cell have spawned both interest in and debate on what to do about the condition. Last year, the NCAA implemented mandatory screening for sickle cell trait among all Division I athletes starting with the 2010-2011 academic year.

What is sickle cell?

Normal hemoglobin are round in shape and carry oxygen in our blood cells. Crescent, or sickle shaped, hemoglobin cannot adequately bind and carry oxygen. The shape also causes the cell to move more slowly through blood vessels and when multiple sickled cells clump together, they can clog or impede blood flow (Fig. 1). This occurrence, called sickling, or sickle crisis, can be associated with severe pain. Sickle cell trait is present in an individual who has 1 normal gene for hemoglobin (Hb) and 1 gene for sickle hemoglobin (HbS). Sickle cell trait is different from sickle cell anemia, in which individuals have 2 genes for HbS (Fig. 2).

Who has sickle cell trait?

Sickle cell trait is a common and usually benign condition found in more than 3 million Americans. The sickle gene, HbS can be found in Americans with African, Mediterranean, Middle Eastern, Indian, Caribbean, and South and Central American ancestry; therefore, testing newborns at birth is required in all states. Some non-life-threatening complications of sickle cell trait are splenic infarction (death of tissue in the spleen) and gross hematuria (blood in the urine). Most people with sickle cell trait live normal healthy lives; however, in athletes who have sickle cell trait, some specific and possibly dangerous clinical problems can occur.

The most serious concern for an athlete is exertional sickling which can quickly progress to exertional rhabdomyolysis (ER). ER is an underreported and misdiagnosed sudden collapse syndrome that can be fatal. Exertional sickling occurs during extremely strenuous exercise, such as that seen in preseason athletic conditioning. Since the year 2000, there have been 16 nontraumatic sports deaths in NCAA Division I football. Four were cardiac related, 1 due to asthma, 1 from exertional heat stroke, and 10 from complications of exertional sickling. That's 63% of the deaths, which makes exertional sickling the leading cause of death in NCAA Division I football.

How does it happen?

Nontraumatic, sudden collapse during sporting activity in an otherwise healthy individual can be attributed to cardiac (heart) problems, exertional heat stroke, asthma, or sickling. Unfortunately, sickling presents differently among individuals and can be mistaken for heat stroke or sudden cardiac collapse. If misdiagnosed, the appropriate

Table 1. Nontraumatic causes of sudden collapse and their features

Sickling	Cardiac	Heat Stroke	Asthma
Weakness & pain	No cramping	Fuzzy thinking	Usually known
Slumps to ground	Falls suddenly	Bizarre behavior	Past episode, poor control
Can talk at first	Unconscious	Incoherent	Breathless, or may wheeze
Muscles "normal"	Limp or seizing	Can be in coma	Gasping, panicky, on hands/knees
Temp < 103°F	Temp irrelevant	Temp often >106°F	Temp irrelevant
Can occur early	No warning	Usually occurs late	Often occurs after sprinting

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treatment can be delayed, resulting in more serious and often fatal outcomes.

Exertional sickling is directly related to intensity of exercise and can begin within 2 to 5 minutes of intense, sustained exercise without rest. The high intensity causes a cascade of symptoms: hypoxemia (low oxygen), acidosis (increased acid content in blood), hyperthermia (elevated temperature) and cell dehydration which together lead to sickling. Because intensity is the cause, the deaths associated with sickle cell trait have occurred during conditioning for the game, not while practicing or playing.

Prevention

The best offense is a good defense, so we start with prevention. The best method of prevention is early recognition of the condition (Table 1). The sports community needs to recognize those who are at risk for exertional sickling and be vigilantly alert to the initial signs and symptoms that indicate trouble. Professional athletes and NCAA athletes are now routinely screened for sickle cell trait so that team coaches, trainers, and physicians will know who is at risk. Again, exertional sickling is an intensity-related syndrome seen during conditioning-type activities that involve an all-out exertion by an athlete. Therefore, all who are involved with a player's training need to know who and what to look for to help the athlete safely participate in his or her sport (Table 2).

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Table 2. Sickle cell trait guidelines

The National Athletic Trainers' Association recommends that athletes with sickle cell trait follow these guidelines:
1. Athletes with sickle cell trait who develop symptoms (muscle cramping, pain, swelling, weakness, tenderness, inability to catch breath, or fatigue) should stop exercise immediately and report to their athletic trainer and coach.
2. Athletes with sickle cell trait function best if they can set their own pace.
3. Prevention measures include decreasing exercise intensity, encouraging a slow build-up of conditioning activities, allowing for frequent rest and recovery periods and increasing time for hydration.
4. Athletes with sickle cell trait should avoid timed serial sprints and sustained exertion for more than 2 to 3 minutes without a break.
5. Activities should be adjusted because environmental heat, stress, dehydration, asthma, and illness predispose those with sickle cell trait to exertional sickling.

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MRSA Infections and Athletes

In this day and age, you would have to be living under a rock to have avoided the terms "staph infection" or "MRSA." For many, those words strike a sense of concern and even fear; but often, people do not understand what the terms mean. For many years, MRSA infection was well known and understood primarily by healthcare workers, in particular, hospital personnel. In recent years, MRSA has increased, not only in healthcare settings, but also in our communities. Staph infections are now commonplace among athletes, both competitive and recreational; therefore, we need to educate athletes regarding this serious and now rather common infection.

What is Staph?

Staphlococcus, or "staph," is a strain of bacteria that can cause infection. There are more than 30 different types of staph bacteria, but not all cause infection. In fact, a person can be colonized with bacteria, which means that bacteria are present on the surface of the body without causing disease in that person. But if the skin is open, as with a cut or puncture, staph bacteria can enter the wound and cause an infection.

What is MRSA?

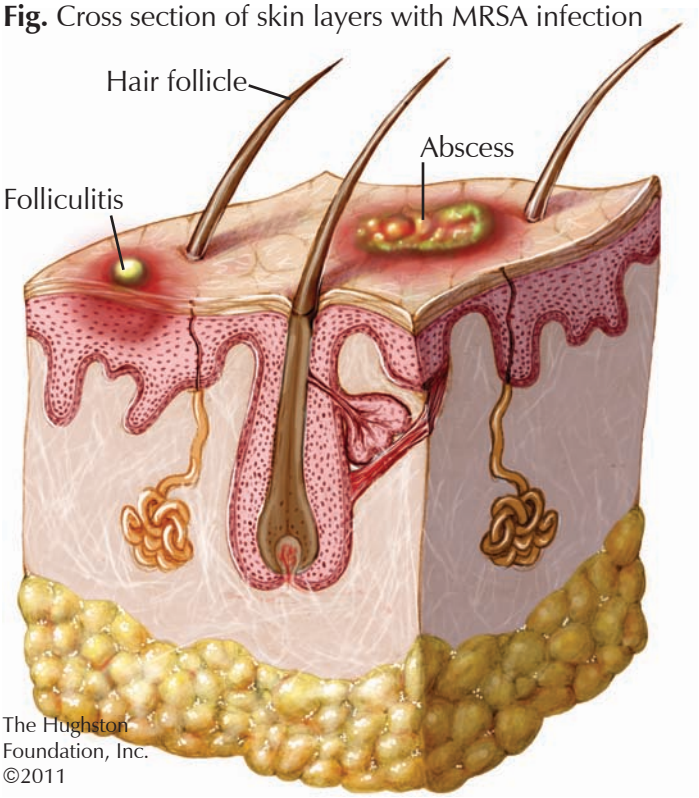
MRSA, or methicillin-resistant Staphylococcus aureus, is but one particular staph strain, so named because of its resistance to antibiotics. MRSA is a strain of bacteria that evolves and mutates after antibiotic usage. Antibiotics, such as penicillin, cephalosporin, sulfanamide, and vancomycin, are prescribed medications given to destroy bacteria that cause infection. Anytime a bacterium becomes resistant to a particular antibiotic, a potential treatment has been eliminated and another antibiotic must be developed to combat that particular infection. Drug-resistant bacteria, such as MRSA, often exist in areas where antibiotic usage is prevalent, such as healthcare settings. Until the early 1990s, MRSA was confined to hospitals, with the first reports of community-acquired MRSA (CA-MRSA), sometimes called community-associated MRSA, surfacing in 1993 in a high school wrestling team. Its community prevalence has continued to grow, and recent statistics suggest that 50% of skin infections are now caused by MRSA.

Studies show that approximately 25% to 30% of the population is colonized, but not infected, with MRSA. That means nearly 1 in 3 people will come into contact with MRSA, including athletes involved in team or contact sports.

Who is most at risk?

Athletes who are involved in high physical-contact sports, such as wrestling, football, and rugby are at risk

Fig. Cross section of skin layers with MRSA infection



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of getting and spreading the infection. However, CA-MRSA infections have been reported among athletes in other sports such as soccer, basketball, field hockey, volleyball, rowing, martial arts, fencing, and baseball. Although little physical contact occurs in some sports during participation, skin contact or activities that lead to the spread of CA-MRSA skin infections can take place before or after participation, such as in locker rooms. Therefore, anyone participating in organized or recreational sports should know the signs of possible skin infections and follow prevention measures (Table 1).

When should you suspect CA-MRSA infection?

Most CA-MRSA infections appear as folliculitis (white headed pimples around hair follicles) or similar skin infection (Figure). The infection often begins with an infected pimple or insect bite. Some infections can progress to abscess formation, and though it is rare, it can persist to a life-threatening illness, such as rapidly progressing sepsis or pneumonia. The most common route of transmission is through an open wound, such as a superficial abrasion after contact with a MRSA carrier. The risk of transmission in athletes increases with poor hand washing, not showering after a workout, sharing personal items, such as razors, towels, and clothing, or not properly cleaning and disinfecting exercise or training equipment.

How is CA-MRSA treated?

The primary treatment for CA-MRSA skin and soft tissue infection includes incision and drainage if an abscess is present, followed by treatment with antibiotics. If caught early, incision and drainage is not always necessary. Your physician can culture any purulent material (pus) from the infected area and send it for a sensitivity profile to determine the most effective antibiotic.

Return to play

Athletes with mild cases of MRSA infection can return to athletic participation once an appropriate antibiotic treatment has begun and the risk of transmission to other athletes has been significantly reduced or eliminated. Cover abrasions or affected areas with protective clothing, and examine the wound daily for signs of recurrence or worsening of the infection. Warn athletes and teammates not to share personal items, and the training staff should disinfect equipment and surfaces that the infected athlete may have come in contact with (Table 2).

As with most medical conditions, certain measures can be taken to decrease the risk of developing and spreading MRSA. Everyone must have a heightened sense of awareness that CA-MRSA not only exists, but also is common. Measures must be taken to prevent spreading the bacteria and causing infection.

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Table 1. Prevention strategies

• Wash your hands with soap and water or antibacterial hand gels
• Cover open wounds and abrasions
• Do not share personal items such as razors and towels
• Practice universal infectious disease protection measures
• Dispose of bandages after dressing changes and routine cleaning of equipment such as training tables, whirlpools, and exercise mats
• Judicious and responsible use of antibiotics by healthcare providers

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Table 2. What to do if you think you have MRSA

• Tell a parent, coach, athletic trainer, school nurse, or team doctor immediately because early diagnosis is crucial
• Pay attention to signs of infection (redness, warmth, swelling, pus, and pain at sites of sores, abrasions, or cuts)
• Do not try to treat the infection yourself by picking or popping the sore
• Cover any infection with clean, dry bandages until you are seen by a healthcare provider

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Unicameral Bone Cysts in Children

Unicameral bone cysts (UBCs) are noncancerous, fluid-filled cavities that are often discovered at the upper ends of the humerus (upper arm bone) near the shoulder and the femur (thigh bone) near the hip. UBCs are usually found in children around the ages of 9 or 10 years, but the cysts can be found in children from 5 to 15 years of age, and they occur more often in boys. The cysts are typically painless and are often found when a bone or joint is x-rayed for other reasons or when the bone surrounding the cavity fractures. A pathologic fracture is a type of fracture that occurs with a preexisting condition, such as a bone cyst, and often results in an unusual fracture pattern. A pathologic fracture involving a cyst can occur from minor trauma, such as throwing a baseball, wrestling, or being tackled in football because the bone tends to be thinner around the hollow cavity.

Very little is known about the development or cause of UBCs. However, there are effective treatments available if the cyst fractures or if there is a danger of the cyst fracturing too close to the growth plate.

Radiographic findings

X-rays of a UBC often reveal a hollow cavity centrally located within the bone. The cysts are radiolucent, which means they do not absorb radiation and thus appear dark on x-ray. The x-ray finding called, "fallen leaf sign" can sometimes be seen. A piece of the cyst wall can fracture and become suspended in the fluid of the cyst giving the appearance of a leaf falling from a tree (Figure).

When the cyst is next to the bone's growth plate (soft area at the end of immature bone where growth occurs), the cyst is called active. Active cysts occur in younger patients and tend to continue to enlarge during skeletal growth. If the cyst enlarges and damages the growth plate it can lead to shortening of the bone. A cyst is called latent when normal bone lies between the cyst and the growth plate. Latent cysts occur in older individuals and do not tend to expand.

Treatment

Often, UBCs resolve without intervention and can be treated with observation alone. However, when the cyst causes a pathologic fracture, weakens the wall of the bone, or when it occurs in an area of high stress, such as the upper end of the weight-bearing thigh bone, surgery is often considered.

Preventing a fracture is the goal of an effective treatment plan. To encourage bone growth that fills in the cavity, making the bone stronger and less likely to fracture, there are several surgical options available:

- percutaneous aspiration (puncturing the cyst with a needle and withdrawing the fluid) and injection of corticosteroid or bone marrow;
- curettage and bone grafting (scraping the inside of the cyst and filling the void with bone or a bone substitute); or
- resection of the cyst (removing the cyst with or without bone grafting).

UBCs with pathologic fractures or cysts with a high likelihood of fracture can be treated with hardware fixation, such as pins, screws, or flexible nails, often in combination with another procedure.

Most cysts heal with treatment, and if left alone, most will heal by the time the skeleton stops growing. The treatment should be individualized based on the child's age, overall health, medical history, and normal activities. Only after a thorough discussion of the risks, benefits, and various surgical and nonsurgical options can a decision be made. A decision can be difficult and the risks of surgery must be weighed with the likelihood of a fracture occurring.

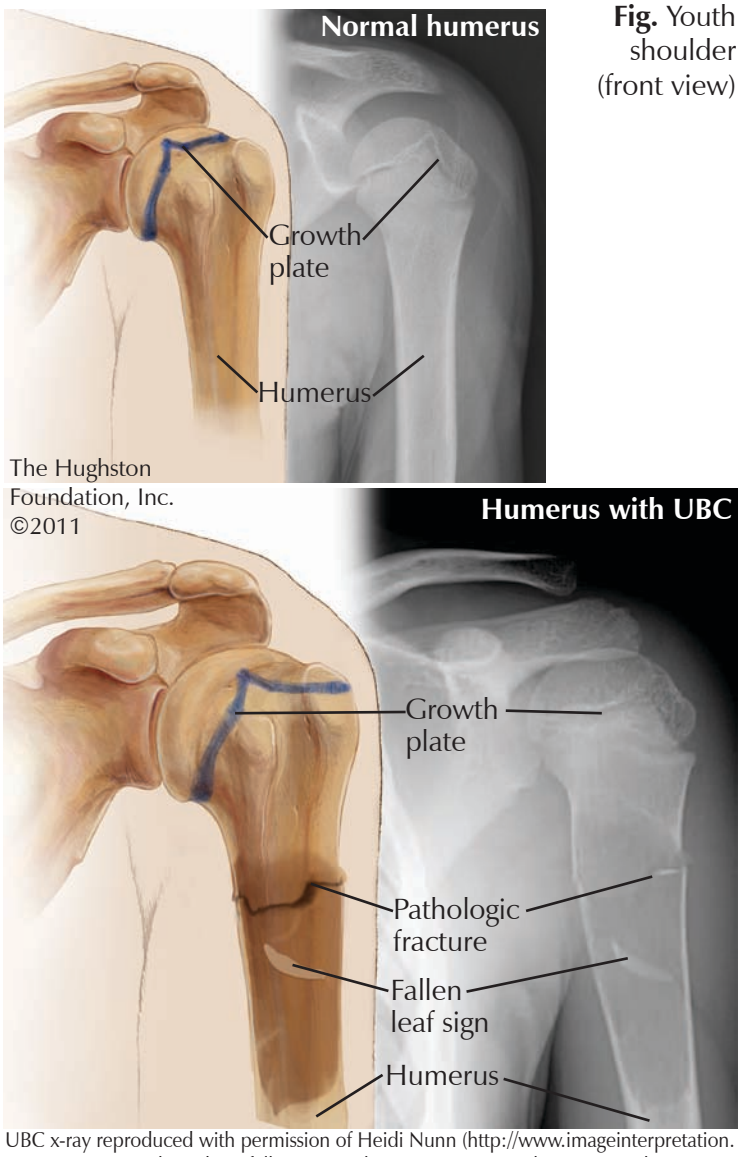

Fig. Youth shoulder (front view)

UBC x-ray reproduced with permission of Heidi Nunn (http://www.imageinterpretation.co.uk) and Norfolk & Norwich University Hospitals NHS Foundation Trust

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