



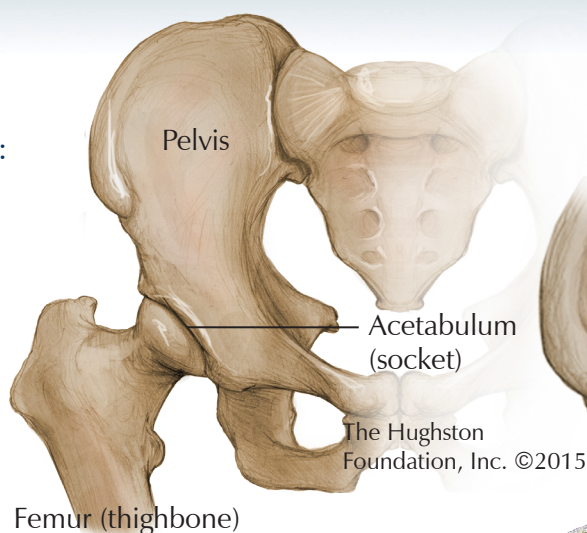
# Hughston Health Alert

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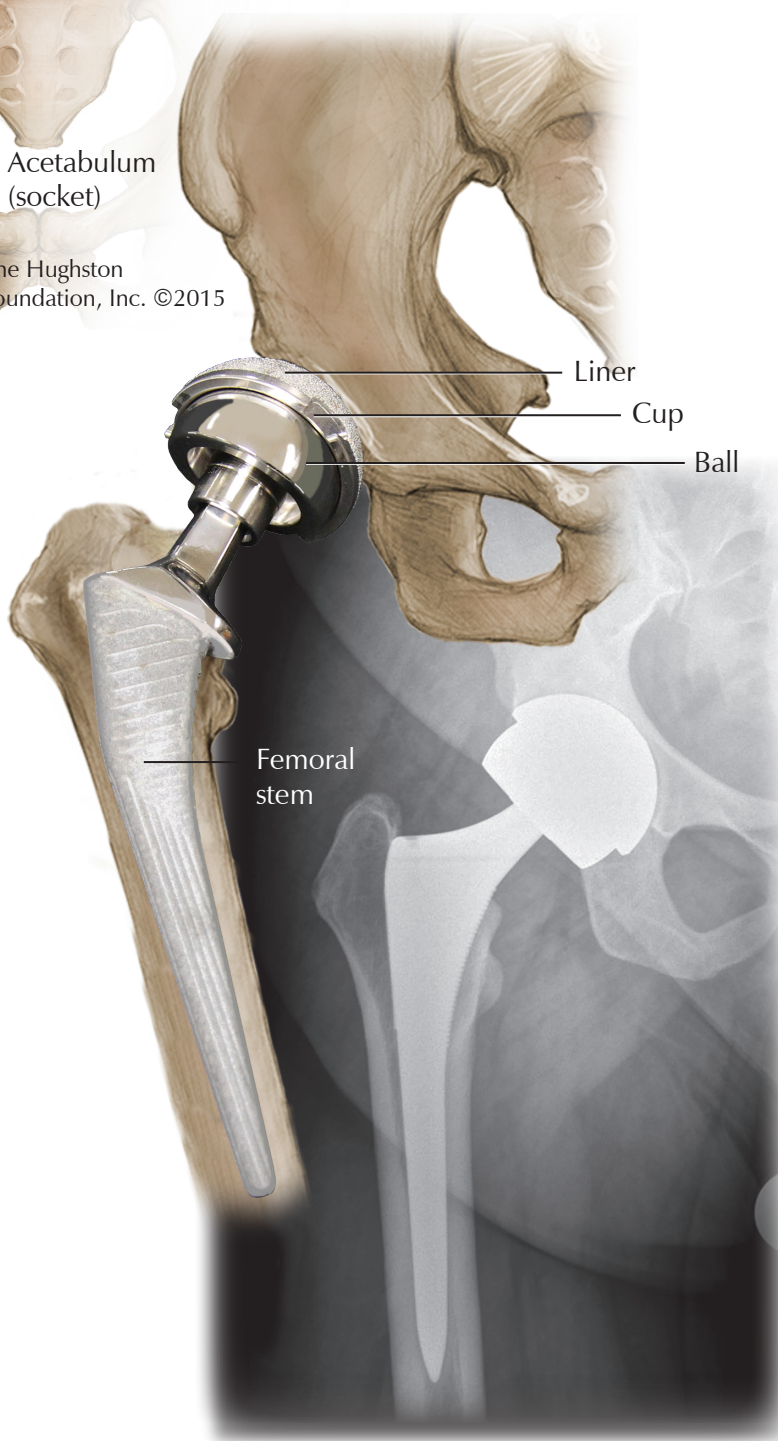
**Fig 1.** (Left to right) Normal pelvis and femur, total hip replacement with metal-on-metal implant, and x-ray showing a MoM implant

## Metal-on-Metal Hip Replacements

Metal-on-metal hip replacements (MoM) (**Fig. 1**) have been associated with a higher risk of failure compared to other types of hip replacement systems. The phrase “metal-on-metal hip replacement” is descriptive and refers to a metal ball that articulates directly with a metal cup to form an artificial hip joint. Some patients with MoM implants may experience adverse tissue reactions. This is because as the 2 metal components rub together, microscopic metal particles can wear off, leaving debris that infiltrates the joint and surrounding tissues. This can lead to serious damage to both the soft tissues and bone. Additionally, metal ions can pass into the bloodstream causing an immune system reaction, hypersensitivity, and potential long-term health problems.

### The hip joint

The hip is a ball-and-socket joint in which the rounded or ball-shaped surface of the femur (thighbone) fits into the cuplike depression of the acetabulum (the socket). The hip joint can withstand repeated motion and years of wear and tear; however, with age and use, the cartilage can become worn down, or damaged and arthritis can develop. Moreover, the hip joint can fracture during a fall or other accident. Any of these conditions can result in hip pain and the need for a hip replacement.



## Types of hip replacement systems

The original total hip replacement system used both metal and plastic parts. A typical total joint replacement involved smooth metal bearings shaped like the top of the thighbone that fit into a hard plastic liner that offered a solid, smooth surface for joint movement. Over time, refinements were made to the plastic. For example, x-ray beams were used to enhance its strength and prolong its life expectancy, creating a material known as “highly cross-linked polyethylene.”

In an effort to find an implant that would last the patient’s lifetime, surgeons have experimented over the years with several types of material. Other than MoM, possible component combinations have included a metal ball with a polyethylene (plastic) cup, a ceramic ball with a plastic cup, and a ceramic ball with a ceramic cup (**Fig. 2**). Each type of bearing surface has its own distinct advantages and disadvantages.

**Fig 2.** Artificial hip revision component combinations



## Problems

Increased incidence of MoM implant failures has caused 2 different MoM hip replacement systems to be recalled. Patients who have recalled implants should be evaluated by an orthopaedic surgeon to determine whether further treatment is needed. Fears of premature failure have caused some patients to have the components removed. If the recalled implants are not removed, periodic follow-up is recommended.

## Symptoms

Indications of a MoM reaction can include pain (especially in the groin), swelling, a palpable lump, rash, limp, spontaneous dislocation, and neurologic problems. Symptoms tend to worsen over time. However, since these symptoms can be caused by other disease processes and it is possible to have a soft tissue reaction without any indications of failure, all MoM hip patients should be evaluated.

## Evaluation

An MoM hip evaluation begins with a thorough history and physical exam. Next, x-rays are taken to determine the position of the implants as well as possible changes in the bones. If the implants are not well positioned, this may increase the wear on the bearing surface. Depending on the preliminary results, some patients may want to have their blood drawn to measure metal ion levels. Your surgeon may also order a MARS or Metal Artifact Reduction Sequence MRI (magnetic resonance imaging), a special MRI for patients who have metal implants that reduces interference from the metal on the image. The MRI can help identify the presence of a large collection of fluid which would indicate an adverse reaction. Sometimes an ultrasound is used instead of an MRI. Additional blood tests and an evaluation of a fluid sample from the hip joint to rule out disease processes may also be ordered. All of the findings from these tests are then used to develop an individualized treatment plan.

## Treatment options

There are currently 2 treatment options for patients who have MoM hip replacements. For patients who have painless MoM hips without any symptoms, close observation is recommended, including regular follow-ups with repeat x-rays and possible additional testing. For those who have painful hips or other evidence of an adverse reaction, further surgery may be recommended. Surgery can include changing out some or all of the implant components, depending on the circumstances. The patient and his or her doctor should discuss not only the benefits, but also the risk of postoperative complications (such as infection, dislocation, and fracture) before proceeding with surgery.

The decision about the type of hip replacement to have should be based on information about past and current implant technology, including data on the possible drawbacks as well as the durability of the system. Most hip replacements are expected to last 10 to 20 years. One disadvantage of MoM hip replacements is that 1 out of every 1,000 patients can have a reaction to the metal particles that can lead to long-term health problems.

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# Heat or Cold Application:

## WHICH SHOULD I USE?

Many people understand that applying hot or cold packs can be beneficial in certain circumstances—for example, after spraining an ankle while playing a sport, after straining lower back muscles while lifting a heavy object, or after undergoing surgery. Confusion often arises, however, when the patient must decide which of the 2 modalities is more suitable for his or her condition. Applying the type of home treatment appropriate to the specific injury and situation can help reduce pain and stiffness, increase tissue extensibility (ability to stretch), and prevent further swelling. In effect, proper treatment can speed up the recovery process, allowing you to return sooner to a normal routine. By contrast, using an inappropriate treatment can result in increased swelling and stiffness as well as decreased tissue extensibility.

### Factors to consider

There are a number of factors to consider before choosing to use a heat or cold modality. First of all, the specific injury or postoperative stage of the patient needs to be taken into account. For example, the premature application of heat in the acute injury stage can increase swelling and discomfort. Secondly, the patient’s medical history and status constitute important factors as there can be contraindications (reasons not to proceed with treatment) to the use of either heat or cold. Finally, patient preference is an issue; in particular, some patients strongly dislike using cold modalities and so may experience increased feelings of discomfort on application.

### Stages of healing

The body begins the process of tissue repair and healing immediately after an injury. The use of hot or cold packs is not designed to put a halt to this process, but rather to control the symptoms. In the case of an injury or a surgical procedure, healing takes place in 3 stages.

Stages of healing and modality to use			
Stage 1	Acute	First 48 hours after injury	Cold
Stage 2	Regeneration	2 days to several months	Heat
Stage 3	Remodeling	Long-term healing	Heat

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### Cold treatments

During the first 48 hours post-injury or the acute phase of healing, cold treatments, such as the use of cold packs and ice (Fig. 2), have been found to be more beneficial than heat treatments. Localized effects of cold treatment include

decreases in blood flow, metabolism, and the overall inflammatory process. The application of cold packs at this time can also reduce pain by slowing nerve conductivity and producing a numbing sensation in the affected area.

Fig 2. Cold pack on sprained ankle



Studies have shown that using cold packs after arthroscopic knee surgery can lead to pain medication reduction and an increase in weight-bearing status. Cold treatments can also be beneficial when rehabilitation exercises reproduce the symptoms of the acute phase. For example, after therapeutic or joint stretching exercises, swelling and inflammation may increase; cold packs can then be used to control these symptoms. Understanding the kinds of sensations to expect and their typical progression can help you better tolerate the application of cold.

Cold application	
1-3 minutes	Feeling of cold or coolness
2-7 minutes	Burning, stinging, or aching
5-17 minutes	Numbness

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A general guideline for home treatment is to apply a cold compress or “bag of frozen veggies” for 15 to 20 minutes up to 4 times a day during the first 48 hours. Never use a cold pack or compress for longer than 20 minutes at a time and never apply directly to bare skin.

### Heat treatments

The application of heat can be beneficial during the second and third phases of healing, which are the regenerative and remodeling phases. However, using a heat modality prematurely can increase swelling and blood flow to the area; this in turn can increase pain and prolong the inflammatory process.

Local physiological effects of heat treatment include vasodilation (expansion of blood vessels) and an increase in tissue metabolism; these effects enhance long-term healing and normal functioning of the involved tissues. Additionally, a decrease in the viscosity or thickness of the tissue through warming enhances its extensibility, allowing freedom of movement.

Moist heat is the most effective form of therapeutic heat because the water will conduct the heat, allowing it to penetrate into the superficial tissues. A simple moist heat treatment can be prepared at home by placing a wet hand towel in the microwave for a few minutes. The wet towel should be heated to a tolerable temperature so that it can be picked up and wrapped in a dry towel, and then placed on the affected area for 15 to 30 minutes.

### Contraindications and precautions

Another consideration in selecting a thermal modality is the patient's medical history. Before applying either heat or cold treatments, there are a number of contraindications to consider and precautions to be taken based on the person's medical status. For example, typical contraindications for the use of cold packs include cold hypersensitivity syndromes, such as Raynaud's phenomenon (a condition in which the blood flow to the extremities is decreased in response to cold, causing numbness and discoloration), impaired circulation, and hypertension (high blood pressure). Contraindications or precautions for the use of heat packs include impaired sensation, areas of arterial insufficiency, vasculitis (inflammation of blood vessels), and the presence of cancer.

Patient preference is again an important factor in selecting the type of treatment. During the acute phase, using cold is more beneficial than using heat, which, as discussed, could have a number of negative consequences. However, once healing has progressed beyond the acute phase, some may find that they are much more comfortable with heat modalities; others who respond well to the use of cold packs may continue to prefer them, primarily because they are easier to use at home. Overall, the individual circumstances and the nature of the injury should dictate the proper modality to use.

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## Bowling Injuries

"Strike," "spare," "lane," "pocket," and "gutter ball"—these are terms heard at the bowling alley while "fracture," "sprain," and "tendinitis" are more often heard on the football or soccer field. If, however, you are not well prepared for your bowling game or not careful, you could sustain a variety of injuries at the bowling alley, including wrist tendinitis, bowler's thumb, and medial epicondylitis (bowler's elbow).

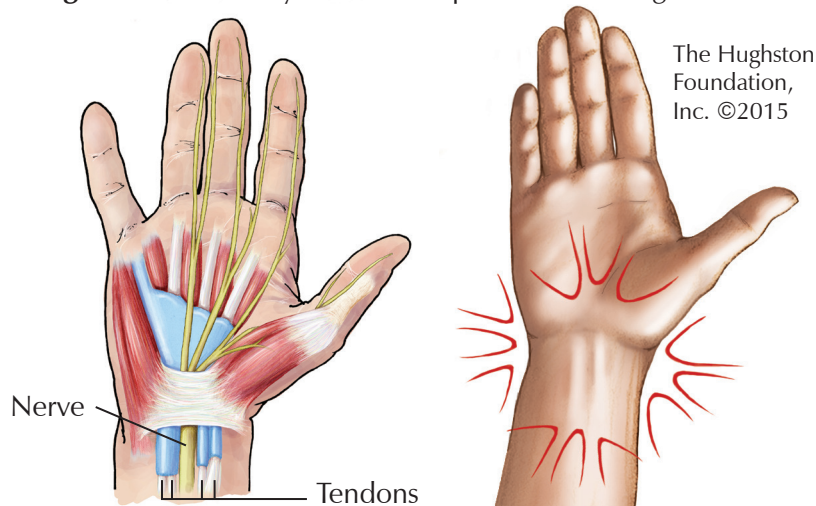
Both the novice and experienced bowler can incur bowling injuries. Although bowling is often viewed as more of a low-risk, leisure sport, the combination of a slippery floor, swinging a heavy object (bowling balls typically weigh 10 to 16 lbs), and repetitive motion carries the potential for injury.

### 3 common injuries

#### Wrist tendinitis

Bowling requires a repetitive motion at the wrist. This repetitive movement can cause the tendons—which cross over the front and sides of the wrist and attach to the small bones of the fingers and thumb—to become inflamed and painful. Symptoms of wrist tendinitis can present in a variety of ways or as a combination of complaints. These include wrist pain or tenderness directly over the offending tendon that can radiate to the forearm or down to the hand (**Fig. 1**). Wrist tendinitis can also present as a burning pain when performing normal daily activities such as getting dressed. If the symptoms are left untreated, the tendon can become swollen and then weaken, eventually leading to loss of motion at the wrist.

**Fig 1.** Wrist anatomy and area of pain and swelling



#### Treatment and prevention

Treatment is primarily a matter of reducing inflammation. There are a variety of ways to do this; first and foremost is rest. Applying ice to the affected area and using nonsteroidal anti-inflammatory drugs (NSAIDs) under a doctor's supervision can also help. If these treatments are not effective, the patient may benefit from local steroid injections.

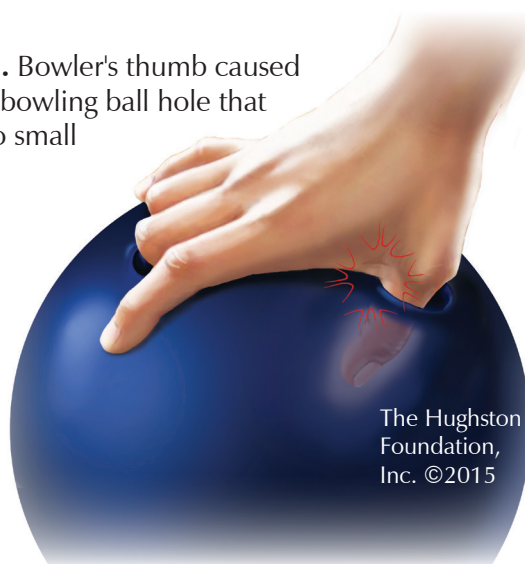
In some cases, surgery may be needed to repair the damage to the tendon. Finally, wearing a wrist splint or brace can help protect the injured or inflamed tendon so it can heal. Such a device can be worn while bowling and during other activities that involve wrist movement.

As with many chronic problems, it is easier to prevent wrist tendinitis than to treat it. Performing gentle stretches of the wrist muscles and tendons (held for 15 to 20 seconds) before and after activity is recommended. Moreover, you should maintain a 3-times-a-week strengthening program for your wrist. If you have had prior wrist problems, wearing a bowler's wrist splint while bowling can help to prevent the recurrence of symptoms.

### Bowler's thumb

Bowlers can develop pain from the thumb pressing against the thumb hole of the bowling ball (**Fig. 2**). The hole may be too small or too tight, causing the nerve that runs along the side of the thumb to be repeatedly compressed. This nerve can also be compressed if the bowler habitually attempts to spin the ball. Bowler's thumb will first present as numbness or tingling at the tip of the thumb and can develop into pain in the web space between the thumb and the index finger. As the condition worsens, the thumb can weaken, making movement difficult.

**Fig 2.** Bowler's thumb caused by a bowling ball hole that is too small



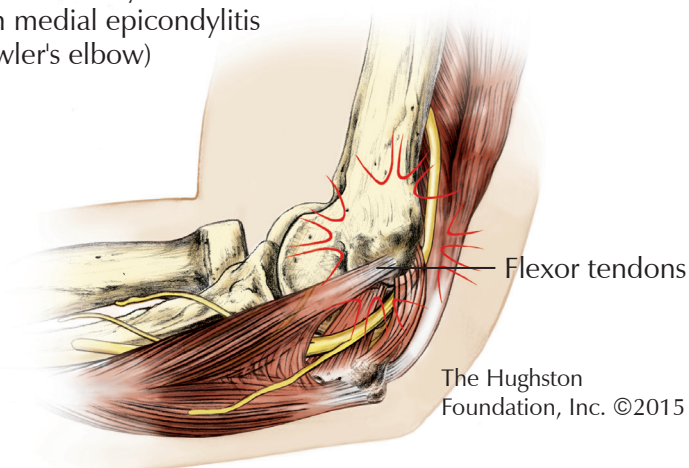
### Treatment and prevention

Like any overuse injury, the best treatment for thumb pain and weakness caused by bowling is to rest until the symptoms have resolved. Additionally, you should eliminate any contributing factors; for example, you should stop using a bowling ball with a thumb hole that is too small or too sharp at the edge. If symptoms do not improve, surgery may be needed to remove the damaged nerve.

Bowler's thumb may be prevented by ensuring that the holes of the bowling ball are in a comfortable position so that it can be held without straining the thumb. Also, wearing

a thumb guard or pad, especially if you put a lot of spin on the ball, can help to reduce the risk of bowler's thumb.

**Fig 3.** Anatomy of the inside of elbow with medial epicondylitis (bowler's elbow)



### Medial epicondylitis

Medial epicondylitis—often known as golfer's elbow or, in this case, bowler's elbow—refers to inflammation of the elbow from the repetitive movements involved in bowling. As a bowler releases the ball, he or she flexes the wrist to roll the ball forward. This motion uses the flexor tendons that attach the forearm muscles to the inside of the bone at the elbow. Overuse of the arm can cause strain and inflammation that presents as pain and soreness on the medial portion of the elbow (**Fig. 3**). If left untreated, the injury can progress to tendinosis, a condition of tissue degeneration.

### Treatment and prevention

The best treatment for medial epicondylitis is to stop the offending activity and rest until the symptoms have resolved. After an adequate rest period, it is important to stretch and strengthen the forearm flexor muscles to rehabilitate them. If progress is slow and the pain and swelling persist, a cortisone injection can sometimes help. If symptoms continue after 4 to 6 months of rest and rehabilitation, the patient may benefit from a surgical procedure to release and excise the degenerative tissue.

A wrist brace can also reduce the stress on the flexor tendons by limiting the motion of the wrist. If soreness does arise, the best strategy is always to stop the activity rather than to overdo it.

As with most overuse injuries, it is easier to prevent a bowling injury than to treat it. If you warm-up before practice or a game you will not only reduce your risk of injury, but you may also improve your game.

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# Necrotizing Fasciitis

Necrotizing fasciitis—also commonly known as flesh-eating bacteria syndrome, or sometimes hemolytic streptococcal gangrene, Meleney ulcer, or suppurative fasciitis—is a very rare but serious inflammatory infection of the fascia (the connective tissue sheath that covers body structures such as muscles) (**Fig**). After attacking the fascia, it secondarily affects the skin, fat, and subcutaneous tissue and can cause severe toxicity in the body. The infection spreads along tissue and fascial planes, but, at least in the early stages, it spares the underlying muscle. A patient whose immune system is in any way compromised (as a result of AIDS, cancer, diabetes, or other chronic disease) or has a history of IV drug abuse, abdominal and perineal surgery, consuming raw saltwater fish, or exposure to infected animals is at greater risk for developing the infection. Necrotizing fasciitis may also arise as a complication of a variety of surgical procedures or medical conditions. Necrotizing fasciitis can affect any part of the body—the extremities, perineum (the region between the pubic and tail bones), and truncal areas are common sites of infection.

## What causes necrotizing fasciitis?

Necrotizing fasciitis develops when a wound, burn, or cut comes in contact with bacteria. Several different types of bacteria can cause the infection, including Group A Streptococcus, Staphylococcus aureus, and Clostridium perfringens. Moreover, the majority of such infections involve organisms that normally reside on an individual's own skin. Necrotizing fasciitis is most often polymicrobial in origin, involving 4 to 5 different types of bacteria. This form is known as Type I necrotizing fasciitis while the monomicrobial variety caused by a single organism is known as Type II. All of these different bacteria release toxins, such as streptococcal pyogenic exotoxins, that eventually destroy the skin and underlying tissue.

## What are the symptoms?

The symptoms of necrotizing fasciitis often emerge quickly after an injury or trauma. Early symptoms include pain and redness that progress rapidly; swelling may or may not be associated with the pain. As the infection worsens, the pain can be severe and accompanied by high fever, chills, and increased heart rate—indeed, the pain may be considerably more intense than one might expect given the size of the wound. Blisters may erupt and crepitus—sounds of grating, crackling, or popping accompanied by sensations under the skin—may also be present. As toxins from the bacteria build up, they can lead to a decrease in blood pressure, damage to the skin, fat, and fascia, and even multi-organ failure and death.

## How is it diagnosed?

Necrotizing fasciitis is diagnosed through a combination of physical exam, laboratory data, and imaging studies. Pain that is out of proportion to the injury and progresses rapidly or redness from a small cut or burn will raise suspicion of the disease. The Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score can be used to stratify patients who exhibit signs of cellulitis (a bacterial infection involving the skin that specifically affects the dermis and which can look like an early stage of necrotizing fasciitis) according to their risk of developing the syndrome. Radiographic images, including x-ray and computed tomography (CT scan), can be used to detect inflammation, fascia separation, tissue destruction, and the presence of air under the skin.

## How is it treated?

It is important to treat necrotizing fasciitis promptly. In fact, the sooner treatment begins the fewer complications the patient is likely to suffer; moreover, if left untreated, the disease is invariably fatal. Treatment typically involves IV fluid, early emergency surgical debridement (the removal of damaged tissue or foreign objects) of the affected area, and use of broad spectrum IV antibiotics. The wound usually exudes liquefied subcutaneous fat and dishwater pus. The diseased skin, tissue, fat, and muscle must be aggressively removed from the wound by irrigation and debridement. In many cases, the patient must undergo multiple-staged surgical debridement of the wound in order to remove the infection. A physician may prescribe several different types of IV antibiotics before the specific organism causing the infection is identified through cultures. Many patients with necrotizing fasciitis need to stay in the intensive care unit of the hospital under the care of an interdisciplinary team. If the infection becomes life-threatening, amputation

may be necessary to save the patient's life. The overall mortality rates for necrotizing fasciitis range from 6%-76% and depend heavily on early diagnosis and debridement.

While there is no sure way to prevent necrotizing fasciitis, keeping the skin clean and intact is paramount. Using antibiotic ointments on wounds is also beneficial. While, on the one hand, necrotizing fasciitis is rare, on the other hand, it can occur spontaneously, and a bruise, abrasion, or even a finger prick can be an opening for bacteria to enter and cause this serious infection.

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**Fig.** Thigh anatomy



# Avoiding Injury When Whitewater Rafting

Since the 1970s, the sport of whitewater rafting has been growing in popularity; given this and the inherent hazards of the activity, there is an increased concern for safety. In the *2013 Recreational Boating Statistics*, the US Coast Guard reported 18 injuries and 14 fatalities from the use of inflatable vessels. Thus, while the risk of injury and death in this adventurous sport is real, it nevertheless remains lower than that of other popular outdoor activities such as horseback riding, surfing, and mountain biking.

## Whitewater Rafting 101

The American Outdoor Association recommends taking an expedition down river with a commercial outfitter, especially if you are an inexperienced rafter. Commercial outfitters provide an experienced guide who will give a short training course, demonstrating how to use the safety equipment and covering the safety rules you are expected to follow on the river. This person will also serve as an expert guide during the trip, though the overall experience of your rafting adventure will depend more on the strength and endurance levels of your team of usually 6 to 8 rafters and the difficulty level of the particular whitewater rapid. Rapids are graded on a scale from I to VI, with class I water being the easiest (essentially moving, flat water) and class VI the most difficult which is rarely, if ever, attempted and then only at a high risk of injury or death.

On commercially-guided expeditions, you are equipped with a snug-fitting helmet and personal floatation device or life jacket that will stay on if you fall into the water and a hard, lightweight plastic paddle. Throughout the trip your guide will instruct you when to paddle—for example, “paddle twice and stop” or “don’t stop paddling”—based on his or her experience with the river’s water level and rapids. Listen to your guide; he or she has the experience you need for a safe trip downstream. Be aware, however, that even with an experienced guide you can get hurt on the water.

## Injuries

The *2013 Recreational Boating Statistics* also reports the occurrence of different types of injuries, such as broken bones, concussions, internal organ injuries, lacerations, scrapes, and bruises in inflatable vessels. Over half of rafting injuries occur while participants are in the raft and are mostly the result of being struck by a fellow rafter’s equipment, such as a paddle. Another common type of injury happens when a rafter is thrown from the raft and strikes an object while “swimming” in the river. The face has been shown to be the most frequently injured body part—with lacerations making up 1/3 of these injuries—followed by the knee. The most common type of injuries

on the water, however, are environmental and include hypothermia—a condition of abnormally or dangerously low body temperature—and sunburn, which is often unreported. By coming into contact with freshwater micro-organisms, rafters are also at an increased risk for rare infections such as giardiasis, schistosomiasis, and leptospirosis. Studies have shown that even after being injured, more than 60% of rafters are able to complete their expedition. Moreover, only 13% of rafting injuries have been shown to be chronic or to have long-lasting effects.

## Prevention

Injury prevention should start with taking the time to plan and follow a few simple, precautionary steps. First, research the location where you will be rafting and make sure your outfitter provides certified guides. While being able to swim is not required, tell your guide if you can’t. Proper clothing is a must. Do not wear heavy clothing that may make it difficult to float or swim. Wear either water-resistant or gym shorts to avoid skin chaffing against the raft. Water shoes or tennis shoes rather than flip-flops are recommended, and leave all jewelry at home. Whether you’re a beginner or experienced rafter, always wear a tight-fitting personal floatation device and never loosen or remove it (floatation devices save more lives on the river than anything else). Depending on the state and class of the rapids, the facility you rent from may not require rafters to wear helmets, but it is encouraged on any rafting expedition. A simple but common mistake is forgetting to apply sunscreen to exposed body parts. Also, avoid alcohol or illicit drugs before and during your rafting adventure. Finally, it is a good idea to familiarize yourself with all your equipment beforehand. And, of course, always start out with lower class rapids until you become more experienced and listen closely to your guide throughout the trip. If you should fall into the water, keep your feet up and pointing down river. The feet-up position reduces the chance that you will hit your head or get your feet caught under water.

The day you spend on the river should be adventure-filled. Create lifelong memories of having fun without being bruised, cut, or hit with a paddle. While participating in whitewater rafting, or any type of outdoor recreation, does carry risks, by taking simple precautionary measures, many whitewater accidents can be prevented.

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Columbus, Georgia

### Further reading:

US Coast Guard. 2013 Recreational Boating Statistics.

<http://c.ymcdn.com/sites/www.american canoe.org/resource/resmgr/SPP-documents/2013RecBoatingStats.pdf>. Accessed April 20, 2015.





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