



THE UNIVERSITY OF TOLEDO MEDICAL CENTER

# ORTHOPAEDIC MONTHLY

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## THE DOCTORS OF TOMORROW: **A Long, Hard, Narrow Road with a Gratifying Result**

*Editorial by Dr. Nabil Ebraheim, Chairman and Professor of Orthopaedics*

The road to becoming an orthopaedic surgeon is long and difficult. For medical students interested in orthopaedics, the road can be even more difficult, as it is among the most competitive of specialties.

Following college, future doctors head to medical school for four years. With some of the best and brightest student applying, it's very difficult to gain acceptance in residency. In addition, the whole process is very expensive. The students and/or families need to take out loans. They learn the importance of tightening their belts and making sacrifices.

After medical school passes, students enter residency. The sacrifices continue as they take calls, delay time with their families and delay having kids or spending time with their children. By the end of residency, they learn and refine their skills in a specific sub-specialty.

Finally, they become independent orthopaedic surgeons. They begin to realize there are struggles at this level as well. They have to worry about health-care regulations, research regulations and patient needs. In addition, they have to worry about the business aspect of their practices and systems. As soon as they solve one problem, they are on to the next problem.

All of this may sound negative, but it usually doesn't deter anyone from going to medical school. More and more people are applying to the medical school. Why? Because being a doctor is the best profession. We are given a special gift and talent, and we are able to use them for the betterment of mankind. Patients come to us to ease their pain and suffering. To be given that opportunity is rare.

There will always be people second-guessing our treatment decisions, our handling of matters, our working hours and our lifestyle, but that comes with the job. We are fortunate to have this opportunity as



doctors. Millions and millions of people want to be in that position. Whether you are a medical student, resident, fellow or doctor, you are fortunate to be in that position; you should be proud of yourself and your profession. You should all get up in the morning with smiles on your faces and a sense of purpose. For when there is a pulse, there is a purpose.

Our specific residency program has selected some of the brightest and most intelligent students from our own University for the forthcoming year. We are delighted to have our own University of Toledo students return for orthopaedic residency. I'm thankful for the opportunity to make a positive impact in the lives of my patients and am thankful we have the opportunity to participate in teaching the doctors of tomorrow. What a great feeling! ■

# Sternal Fractures

The sternum is the t-shaped bone located at center of the chest (thorax). It is responsible for connecting, via cartilage, the rib bones to form the anterior section of the rib cage. The sternum is essential in protecting the lungs, heart and major blood vessels. A sternal fracture refers to a break in the continuity of this bone.

Sternal fractures are usually the result of high-energy injuries. Motor vehicle accidents are the most common cause of sternal fractures, resulting from impact with the steering wheel or dashboard. Deceleration injuries combined with hyperflexion of the torso — as seen in motor vehicle accidents — can result in a combination of sternal and spinal fractures.

In the case of motor vehicle accidents, it's essential to understand if the sternal fracture is direct or indirect. Direct blows to the sternum usually result in posterior dislocation of the sternal body on the manubrium (broad, upper part of the sternum) in association with multiple rib fractures. An indirect fracture is a mechanism of flexion-compression injury to the thorax with the manubrium displaced posteriorly on the body of the sternum by traction exerted by the strong attachments of the first and second ribs. This injury is accompanied by one or more thoracic vertebral compression fractures secondary to severe hyperflexion. Sternal fractures also manifest in high-contact sports.

For isolated sternal fractures, the outcome is usually very good. However, there are several associated injuries that may increase complications and the mortality rate.

If a patient presents with a sternal fracture, physicians should suspect multiple severe injuries, possibly to the heart, lungs and major blood vessels. Specific injuries include:

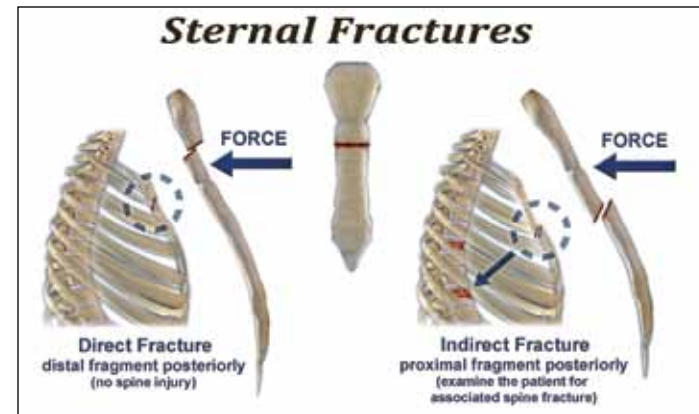
- Aortic disruptions
- Bronchial tears that may impede breathing
- Flail chest
- Myocardial and pulmonary contusions
- Vertebral fractures

A patient with a sternal fracture will likely present with the following symptoms:

- Crepitus (crunching sound when broken bone ends rub together)
- Pain
- Pain worsening with deep breaths or movement
- Swelling over the fracture site
- Tenderness over the fracture site

To diagnose a sternal fracture, physicians utilize a combination of physical examination and diagnostic imaging. During physical examination, physicians look for localized pain over the fracture site that is reproducible. In addition, physicians assess for signs of the associated injuries listed above. Diagnostic imaging, utilizing X-ray and CT scans, is utilized to confirm sternal fracture diagnosis. Since cardiac injuries are commonly associated, physicians also may order an electrocardiogram to assess the heart health.

In most cases, a sternal fracture can be treated conservatively by limiting movement and reducing pain. If the fracture is displaced or has associated injuries, surgery may be necessary. Displaced fractures will need to be realigned surgically. ■



# Reiter's Syndrome



Reiter's syndrome, also known as reactive arthritis, is a group of symptoms that results from gastrointestinal, viral or genitourinary infection.

Ligament and tendon insertion inflammation is a common issue for patients with Reiter's syndrome. Achilles tendonitis, plantar fasciitis and patellofemoral syndrome are common, specific conditions associated with Reiter's syndrome.

Reiter's syndrome is referred to as reactive arthritis because the resultant symptoms are caused by another infection in the body. The inflammatory symptoms are caused by bacterial infection. Classic symptoms for Reiter's syndrome include: inflammatory arthritis of the joints, conjunctivitis (inflammation of the eyes) and urethritis (inflammation of the urethra).

Reiter's Syndrome continued on page 3.

Reiter's Syndrome continued from page 2.

To accurately diagnose Reiter's syndrome, a physician utilizes a combination of history, physical examination, imaging and blood work. During physical examination, physicians look for pain, erythema, swelling and heat in the joint. In addition, a culture may be taken of the throat, urethra or cervix to assess for causative organisms. If the knee is affected, synovial fluid may be aspirated for examination. X-ray and MRI imaging also may be utilized to confirm the diagnosis.

A blood test may be utilized to identify if patients have the gene HLA-B27. Approximately 75 percent of patients with reactive arthritis carry this specific gene. While HLA-B27 does not predispose patients

to the initial infection, it increases the risk of developing arthritis that is more likely to be severe and prolonged.

To treat Reiter's syndrome, it is essential to eliminate the initial infection with antibiotics. Once this has been achieved, treatment is symptomatic for each additional problem. Analgesics and steroids may be needed for patients with severe reactive arthritis who do not respond to initial antibiotic treatment.

For most patients, severe symptoms last only a few weeks or up to six months. However, chronic arthritis may occur in some. ■

# Clostridium Difficile and Perfringens

## Clostridium Difficile

Clostridium difficile (C. difficile) is a gram-positive bacterium that causes diarrhea and serious intestinal conditions, such as colitis (swelling of the colon). In the body, there is a healthy balance of helpful and harmful bacteria, including the C. difficile bacterium. When this balance changes, C. difficile may enter the colon and release chemicals that cause inflammation of the colon's lining.

Patients with C. difficile will likely present with the following symptoms:

- Abdominal tenderness and pain
- Diarrhea (at least three bowel movements per day for two or more days)
- Fever
- Loss of appetite
- Nausea

To diagnose C. difficile, physicians utilize several different modalities. First, patients undergo a thorough history and physical examination. Physicians also may perform blood tests or take stool samples.

There are several risk factors for developing a C. difficile infection. They include:

- Being elderly (65 years or older)
- Prolonged hospital stays or sharing a room with a C. difficile-infected patient
- Prolonged use of antibiotics
- A weak immune system

Since antibiotics are utilized to kill bacteria, including helpful bacteria, patients with prolonged use are more susceptible to C. difficile infection. Prolonged use may upset the balance of helpful and harmful bacteria in the colon. Antibiotics that most often lead to C. difficile infections include fluoroquinolones, cephalosporins, clindamycin and penicillins.

Treatment for C. difficile infection aims to replenish fluids and prevent dehydration. Patients may be asked to stop or change their current

antibiotics. Specific antibiotics, such as vancomycin or metronidazole, may be given. In addition, patients may be given oral or intravenous therapy to replenish fluids.

There are methods to prevent C. difficile infection. Patients should wash their hands with soap and water, especially when visiting health-care facilities. In addition, they are advised to use antibiotics only when their doctor recommends them and for the recommended time.

## Clostridium Perfringens

Clostridium perfringens (C. perfringens) is a gram-positive bacterium that is the most common bacterial agent for developing gas gangrene. Usually occurring at the site of trauma or recent surgical wound, gas gangrene produces toxins that cause tissue necrosis and related symptoms.

Patients with gas gangrene will present with the following symptoms:

- Air under the skin
- Blisters filled with brownish-red fluid
- Drainage from tissue
- Fever
- Increased heart rate
- Pain around skin injury
- Pale skin color

To diagnose a C. perfringens infection or gas gangrene, doctors begin with a thorough history and physical examination. Next, physicians likely acquire laboratory studies, including a blood culture and a gram stain of fluid from the infected area.

Antibiotics are needed for treatment. Penicillin prophylaxis is usually utilized, as it helpful in killing clostridia. Prompt surgical attention is essential for removing dead, damaged and infected tissue. This is done through an operation referred to as an irrigation and debridement. Amputation of an arm or a leg may be necessary to control the spread of the infection. ■

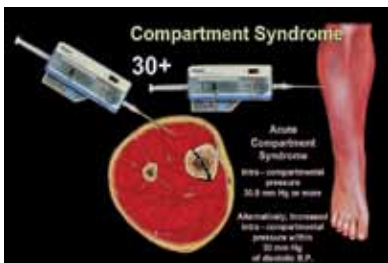
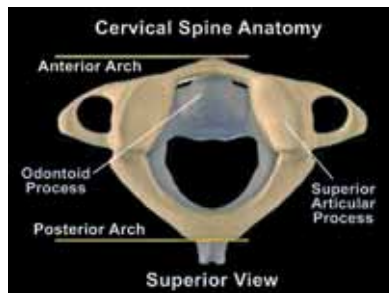


## YouTube Educational Materials for Doctors and Patients

Dr. Nabil Ebraheim recently added three orthopaedic educational videos to YouTube for patients and doctors. The videos can be viewed at the following links:

- **Fracture Fixation:**  
[youtube.com/watch?v=21pIYYmaxi8](https://www.youtube.com/watch?v=21pIYYmaxi8)
- **Compartment Syndrome:**  
[youtube.com/watch?v=hDHyrhbwq-M](https://www.youtube.com/watch?v=hDHyrhbwq-M)
- **Cervical Spine:**  
[youtube.com/watch?v=\\_WEb-cT76xw](https://www.youtube.com/watch?v=_WEb-cT76xw)

Please check them out.



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Neither Dr. Ebraheim nor Dave Kubacki have any relationships with industry to disclose.

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