



THE UNIVERSITY OF TOLEDO  
**MEDICAL CENTER**

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# ORTHOPAEDIC MONTHLY

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## UTMC Orthopaedic Department Selected by Synthes to Create Geriatric Fracture Program

UTMC's Orthopaedic Department was recently asked by Synthes to participate in its geriatric fracture program aimed at providing timely, quality care to elderly patients who suffer from fragility fractures. The plan utilizes an interdisciplinary approach with teams trained to manage elderly patients. There are established protocols in place with a system allowing for continuous improvement.

There will be several benefits for patients, physicians and the hospital. Patients will benefit from better outcomes, fewer complications, shorter lengths of stay, faster recovery times, less pain, decreased mortality and improved chances to regain pre-injury status. Physicians will benefit from improved outcomes and access to potential research and teaching opportunities.

The program will adopt standardized orders for elderly fracture patients and establish care plans, pre- and post-operatively. In addition, Synthes will also provide data collection assistance. As a whole, the program will be continuously tracked to allow for improvements in care.

According to Dr. Nabil Ebraheim, chairman and professor of orthopaedic surgery at UTMC, the program utilizes the University's top-notch specialists to provide care for the sick, the elderly and the injured. The hospital is connected to the Orthopaedic Center, so patients benefit from access to specialists from areas such as neurology, pulmonary, vascular and cardiology.

Orthopaedic surgeons at UTMC have extensive experience in the management of elderly patients. In fiscal year 2008, more than 258 surgical cases were performed on patients over the age of 80; in fiscal year 2009, the orthopaedic department has already performed 191 surgical cases.

## Orthopaedic Center Provides Care for Mother and Son



Following an accident that landed him at The University of Toledo Medical Center, 14-year-old Daniel O'Connor relied upon the same orthopaedic expertise that saved his mother's life and possibly his own 15 years earlier.

Jill, Daniel's mom, was six months pregnant with Daniel when a motorist ran a red light and struck her car. The result was a broken pelvis, a severe problem because an operation to set the bone could start contractions or harm the fetus. However, a delay in surgical intervention could result in arthritis of the hip. Luckily, the surgery went well, the hip recovered and several months later Daniel was born.

Fifteen years later, attention turned to Daniel following an accident at Fremont Recreation Center pool. As he was preparing to jump off the board, he slipped and the board snapped up, striking his leg. The injuries were serious. Daniel needed immediate attention as he had suffered a grade 3 open tibia fracture. The bone pierced through his skin which could result in compartment syndrome.

Orthopaedic surgeons at UTMC quickly went to work on Daniel to restore function to a leg that was on the verge of needing amputation. After thorough cleaning, an external fixation device was placed on Daniel's leg to properly align the bone and immobilize the leg. Skin grafts were then utilized. Now, nearly two years



later, x-rays show fracture sites that are well-healed. Daniel is moving around swiftly and back to being a kid again with no restrictions.

# Simple Tests for Diagnosis of Orthopaedic Conditions

## Part 2

Before any studies are done or medications are prescribed, an orthopaedist begins with a thorough physical examination of the patient. During this process, the physician investigates the patient's body with a series of tests to locate areas of pain or concern. Once the series of tests are completed, imaging is often used to confirm physical examination findings.

In this second installment (see the February 2009 issue for part 1), we examine orthopaedic tests including: too many toes sign; the squeeze test; Hawkin's test; Neer test; the shoulder apprehension test; Lachman test; McMurray test; and Watson test.

### Too Many Toes Sign

The too many toes sign is a forefoot examination used to measure abduction of the forefoot. This refers to deviation away from the midline of the body. For this test, the physician will examine the patient's foot and ankle from behind. In a normal examination, the physician would only be able to see the fifth toe – the ankle would be in neutral alignment. If the foot is flatter than the other (the arch of the foot has dropped toward the floor) the fourth and third toe on that foot may also be seen. This examination shows the forefoot has moved away from the big toe and away from the midline.

### Squeeze Test

The squeeze test is an ankle examination used to identify high ankle sprains. To perform the test, the physician will ask the patient to pull his or her foot toward their shinbone (dorsiflexion). Next, the physician will place one hand on the tibia and the other on the fibula and squeeze them together. If there is pain over the space between the two bones the exam suggests tibiofibular syndesmosis injury.

### Hawkin's Test

The Hawkin's test is an examination of the shoulder used to diagnose shoulder impingement of the rotator cuff muscles. In this test, the physician will flex the patient's arm to 90 degrees, bend the elbow to 90 degrees and then rotate the humerus internally while stabilizing the scapula. This will drive the greater tuberosity under the coracoacromial arch impinging the supraspinatus tendon.



Hawkins Test: used to diagnose shoulder impingement of the rotator cuff muscles

### Neer Test

A second examination of the shoulder used to diagnose shoulder impingement of the posterior cuff is the Neer test. Here, the physician will passively forward flex the shoulder overhead to 180 degrees while stabilizing the scapula. Any pain noted during movement is a positive test.



Neer Test: used to diagnose shoulder impingement of the posterior cuff

### Shoulder Apprehension Test

A third examination used to assess shoulder instability is the shoulder apprehension test. Here, the patient will be asked to lie in a supine position. With the shoulder abducted 90 degrees, the physician will hold the patient's wrist and apply forward pressure from behind the shoulder. If there is pain felt when the shoulder is externally rotated, the exam is positive.

### Lachman Test

The Lachman test is a knee examination used to diagnose a torn ACL. For this examination, the patient will be asked to lie on his or her back with the knee bent at a 30-degree angle. The physician will then hold the end portion of the patient's thigh with one hand and the top of the shin with the other. Pressure is then applied to the back of the proximal tibia below the knee. Here, the physician will determine if the knee joint is loose; a sign of an ACL injury.

### McMurray Test

A second examination of the knee used to diagnose tears in the meniscus is the McMurray test. To conduct this test, the patient will be placed in the supine position. The physician will then place one hand over the top of the knee with his or her thumb over one joint line and an index and middle finger over the opposite joint line. With the knee in forward flexion, the physician rotates the tibia medially and laterally. The tibia is then laterally and medially rotated and extended beyond 90 degrees. A test is positive if a click is heard or felt.

# Commonly Missed Orthopaedic Injuries

## Part 2

Despite the sophistication of imaging and the thoroughness of a physician's physical examination, some injuries remain difficult to diagnose. Obviously, it is imperative for the diagnosis to be made as soon as possible to yield the best possible results for patients. In this second installment of commonly missed orthopaedic injuries (see the February 2009 issue for part 1) we look at quadriceps tendon rupture, Lisfranc injuries, stress fractures, scaphoid fractures, chance fractures and patient's with compartment syndrome.

### Quadriceps Tendon Rupture

The quadriceps tendon is located at the top of the patella, with the quadriceps muscle just above the tendon. The quadriceps tendon is essential to moving the knee from a bent to an extended position. As the quadriceps muscle contracts, it pulls the knee's muscles and tendons including the quadriceps tendon to move the knee into extension. These injuries are sometimes missed, as they are thought to be knee sprains. A combination of physical examination and imaging is needed to diagnose a ruptured tendon correctly. During physical examination, palpation should reveal the patella moving downward toward the knee. Patellar x-rays, on the other hand, will reveal abnormal position of the patella. Patients may also present with an inability to weight bear or lack muscle strength when extending against resistance.

### Lisfranc Injuries

The Tarso-metatarsal joint complex is referred to as the Lisfranc joint complex. Physicians should look for displacement of the second metatarsal. To confirm the diagnosis, physicians should obtain CT scans or stress views. Swelling in the midfoot region and an inability to weight bear are telling signs of Lisfranc injuries. Surgery is needed for unstable Lisfranc injuries, which is the typical presentation. However, a splint may be used in non-displaced Lisfranc injuries.

### Stress Fractures

Stress fractures are overuse injuries associated with muscle fatigue. Typically, fractures are the result of acute events. Stress fractures, on the other hand, are the result of repetitive stress with a less severe force. Eventually, the fatigued muscle transfers excess stress to the bone causing small cracks in the bone. Physical examination and history are very important factors in the diagnosis of stress fractures as they may not show up on x-rays until several weeks later. While x-rays may show evidence of bone healing, it may be helpful to obtain an MRI or bone scan to confirm the diagnosis. Treatment for stress fractures is usually conservative. Rest is the preferred management.

### Scaphoid Fractures

The scaphoid is a small wrist bone located on the thumb side of the hand. Fractures of the scaphoid are sometimes missed, which is potentially problematic as scaphoid fractures have a high risk of delayed union and non-union. In addition, there is a high risk of avascular necrosis with proximal pole fractures. Avascular necrosis is a condition where blood supply to the area of a bone is lost, permanently or temporarily, causing the bone tissue to die.

Scaphoid fractures are best evaluated by MRI. Cast immobilization can be utilized for stable and non-displaced fractures, while surgery is needed for displaced fractures.



Depiction of a scaphoid fracture

### Chance Fractures

A Chance fracture is a type of thoracolumbar spine fracture characterized by a horizontal avulsion injury of the vertebral body caused by flexion in which the entire vertebra is pulled apart by a strong tensile force. This type of spine fracture, which is commonly missed during initial evaluation, is also known as a seatbelt injury. Physicians who suspect a Chance fracture should look for associated abdominal injuries such as colon injuries in the pediatric population.



Depiction of a chance fracture

### Compartment Syndrome

Compartment syndrome is an emergent situation which requires immediate attention. It is defined as increased pressure in a closed space that decreases tissue perfusion in tissue ischemia and necrosis. Compartment syndrome is often found in the leg and forearm. Five features of compartment syndrome physicians should look for are pain, pallor, paresthesia, pulselessness and paralysis. However, the most important diagnostic sign is pain on passive stretch of the toes and fingers. Compartment syndrome is imperative to diagnose in the impending, because once it is established it may lead to Volkman's ischemic contracture – the end state of neglected acute compartment syndrome with irreversible muscle necrosis leading to ischemic contracture. Total ischemia of 8 hours produces irreversible changes in muscle. An urgent fasciotomy is the single effective treatment. This is a surgical procedure where the fascia is cut to relieve tension or pressure.



# The Orthopaedic Department Welcomes the Incoming Orthopaedic Residents



Joshua Philbrick



James Lyons



Jacob Miller



Brian Evanson

On March 15, the Department of Orthopaedic Surgery received the results of the resident match program. For the first time, the Department will welcome four first-year residents to the program. Following a site visit in 2007, the program was awarded a full 5-year accreditation cycle and an increase in resident complement. It is our pleasure to congratulate and welcome The University of Toledo's Joshua Philbrick, James Lyons (Wright State University), Jacob Miller (Wayne State University) and Brian Evanson (Indiana University School of Medicine) to our program.

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Editors: Dr. Nabil Ebraheim, department chairman and professor of orthopaedics, and Dave Kubacki, assistant to the chairman.

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

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