



THE UNIVERSITY OF TOLEDO  
**MEDICAL CENTER**

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THE UNIVERSITY OF TOLEDO MEDICAL CENTER

# ORTHOPAEDIC MONTHLY

VOLUME 2, ISSUE 6 JUNE 2008

## Future Advances for the Orthopaedic Center

*Fox Toledo to Feature UT Orthopaedic Center on Net2Health*



THE UNIVERSITY OF TOLEDO  
**MEDICAL CENTER**

*Team Ortho*

**FOX TOLEDO**



UT's Orthopaedic Center strives to provide the best possible care for its patients. This commitment includes refining and improving the Center's current offerings by making additions and innovations to the process. Our goal is to provide a patient-centered experience where patients feel comfortable, confident and happy with the care they are receiving. We found the best way to achieve this goal is to provide unparalleled access, service and convenience.

To help patients in pain, the team at the UT Orthopaedic Center has created a system that provides easy access to orthopaedic care. We now guarantee patients an appointment with an orthopaedic specialist within 24 hours of calling the Center, and if there is an emergency, such as a fracture, we'll see the patient immediately. For patients who may not be able to come in during the week for an appointment, the Center offers Saturday clinic hours from 8 a.m. to noon.

The UT Orthopaedic Center was created with patient convenience in mind. We have virtually every service in one location, including registration; physical exams; x-ray, dexta and MRI imaging; outpatient lab work, patient education in a dedicated conference center; outpatient procedures; urgent care; areas for soft good and casting; and financial

counseling. All of these services are housed in one building that was designed with patient comfort in mind. We have a coffee and snack bar and elegant waiting areas with televisions and free valet parking. Upon arrival, patients are greeted by a member of Team Ortho who personally guides each patient through the Center's process.

While we have made great strides in establishing a patient-centered experience, we are looking for additional ways to provide superior service. First, we'd like to provide nutritional and psychological support for our patients. In addition, we'd like to offer a variety of services including specialized musculoskeletal physiotherapy. We also hope to add preventative medicine, rehabilitation and a pharmacy in close proximity to the state-of-the-art center. Finally, we hope to connect with a dedicated inpatient orthopaedic unit with state-of-the-art equipment that matches the elegance of the UT Orthopaedic Center.

Another positive step for the Orthopaedic Center was being selected by Fox Toledo as the orthopaedic representative for the television station's Net2Health program. The goal of the Net2Health program is to connect the Toledo community with the best local health specialists in the area. This is a developing relationship that will benefit

# Future Advances for the Orthopaedic Center

*Continued from page 1.*

the Orthopaedic Center and the Toledo community. The Net2Health campaign will feature both a Web and television presence.

The department of orthopaedic surgery recently secured a \$4.5 million research grant from the state. The grant will help the research PhD's further their orthopaedic studies. Dr. Vijay Goel will continue to work on spinal research, Dr. Champa Jayasuriya will work on bone regeneration and Dr. Beata Lecka-Czernik will work on diabetes. We are in the process of acquiring other PhD's to aid in research at the

Orthopaedic Center.

We are always looking for ways to improve service and provide better care for our patients. Through our commitment to patients, we are constantly improving the Center. In the end, what matters most to us is patient satisfaction. As Fox Toledo said after walking through the Orthopaedic Center for the first time, "first impressions, lasting results."

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## Orthopaedic Center Treats 16 Year Old Following a Ladder Injury



*Chad Weiner*

When Weiner hit the ground, the damage had been done to his ankle. He was brought to the Orthopaedic Center and was diagnosed with a right syndesmotic ankle injury.

The syndesmosis is the large ligament above the ankle that joins together the two bones of the lower leg. These two bones, the tibia and fibula, run from the knee to the ankle. The most

According to the U.S. Consumer Product Safety Commission, there are more than 164,000 emergency room treated injuries in the U.S. each year related to ladders. On May 5, Chad Weiner unfortunately became part of that statistic.

"I wish I could say I got injured doing something like playing football, but I actually just injured my ankle when I was climbing down from a ladder," Weiner said.

common cause for this type of injury is a combination of external rotation and hyperdorsiflexion. Both cause a widening of the mortise resulting in disruption of the syndesmosis and talar instability.

It was clear, Weiner needed surgical intervention. Orthopaedic specialists placed a syndesmotic screw between the tibia and fibula to hold the bones in proper alignment while the syndesmotic ligament healed. Weiner is now on crutches sporting a CAM boot and on the road to full recovery.

"Everything went really well here," Weiner said. "I've got a lot of confidence in my doctors here."

As mentioned earlier, ladder injuries are commonly seen in emergency rooms. Of the cases for which location of the injury was recorded, 97 percent occurred in a non-occupational setting. It's important when using ladders to exercise several practices to ensure safety including:

- Make sure the weight your ladder is supporting does not exceed its maximum load rating;
- Set single or extension ladders at a 75 degree angle;
- Ensure all locks on extension ladders are properly engaged;
- Have someone hold the bottom of the ladder; and
- Abstain from standing on the top step or bucket shelf.

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## Robotic and Computer-Assisted Orthopaedic Surgery

### ***New Advances and Challenges for the Orthopaedic Surgeon***

With the advent of computers, the landscape of surgery began to drastically change. Computers now allow surgeons to operate with better precision and accuracy. Robotic surgery has always been a particularly attractive option for orthopaedic surgeons because it is well suited to operate on bones and it increases

the accuracy of implantation and component placement. These advantages lead to better long-term outcomes.

To understand how surgical robots and computers have assisted surgeons, it's helpful to start with surgical computer navigation. Navigation systems allow surgeons to perform actions in real time using information conveyed through a virtual world, which consists of computer-generated models of surgical instruments and virtual representations of the anatomy being operated on. These representations are obtained through

# Robotic and Computer-Assisted Orthopaedic Surgery

Continued from page 2.

CT scans and fluoroscopy. Navigation systems currently in use have three major components:

- The surgical object includes bones and accompanying tissues in the surgical field;
- The virtual object is the virtual representation of the surgical object; and
- The navigator is the coordinate system in which the location and orientation of the target are expressed.

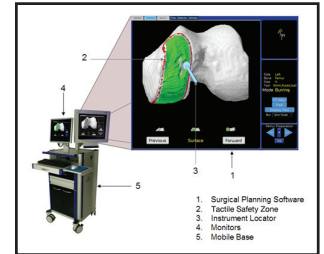
The two most common types of computer navigation are CT-based and fluoroscopy-based navigation systems. A CT navigation-based system uses CT scans to acquire data pre-operatively. This data is then loaded into the navigation system and helps the surgeon through detailed 3D images. Fluoroscopy-based navigation utilizes 2-D images taken from different orientations to create 3D images. This form of navigation is particularly helpful because it provides real-time movements and changes of the surgical objects.

Surgeons are now taking the success of computers a step further and moving toward robotic systems that may actively or semi-actively participate in surgery. Of course, preoperative and intra-operative data obtained through computer navigation is essential for the robot's success.

There are three models for robotic surgery. First, robots can operate with complete autonomy. Here, the robot carries out the pre-operative plans without immediate human intervention. Second, a robot and a surgeon interact with each other during the operation. This model works through a process consisting of

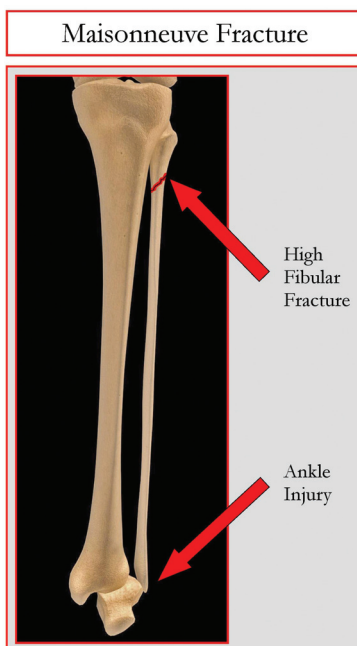
four regions of active constraint. The safe region means that the surgeon is away from soft tissue and free motion is permitted. The close region means the surgeon is near soft tissue and motion is partially constrained by the robot. The boundary region means the surgeon is about to touch soft tissue and motion is severely constrained. Finally, the forbidden region means the surgeon is cutting into the soft tissue and motion is not allowed. In essence, the surgeon is operating the cutting tool while the robot monitors the surgeon's motion and permits or prevents free motion depending on the location of the surgeon's action. Pre-operative information communicating with sensors determines whether the surgeon is operating at the right spot. The final model is teleoperation. In this case, surgeons control every motion of the robot through a control console. Information is transmitted to the surgeon. This model is common in minimally invasive surgery.

These types of surgery are not too common and are used on only a select group of patients. There is a learning curve and the devices can be expensive. In addition, training is good, but short. Surgeons sometimes feel they can achieve as good and more efficient results using traditional methods of surgery.



Rendering of Mako Surgical's Makoplasty surgical robot which is used for knee arthroplasty.

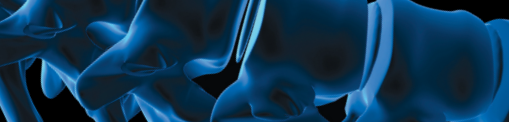
## Occult Ankle Injuries



The ankle is the most commonly injured joint in the body. It is comprised of three bones: the lower end of the tibia, the fibula and the talus. Because it is so commonly injured, doctors sometimes have "tunnel vision" when evaluating an injury and may confuse a simple ankle sprain for a more complex issue. Common injuries that have the potential to be missed by doctors include: maisonneuve fractures; deltoid ligament and syndesmotic injuries; and posterior tibial tendon ruptures.

Ankle injuries are typically classified into four injury patterns – supination-adduction, supination-external rotation, pronation-abduction, and pronation-external rotation. These patterns determine how the force affects the ankle joint and consequently which structures are injured.

Maisonneuve fractures are spiral proximal fractures associated with an ankle joint injury. This type of injury is very common in athletes. It usually results when the foot is planted on the ground and the lower leg rotates around it. The force is translated through the interosseus membrane, travels up the leg, and exits through the top of the bone. The resulting injury is a proximal fibular fracture. Because the talus appears in normal position and there is seemingly no fracture on either side of the ankle, these injuries are easily overlooked. However, maisonneuve fractures of the proximal fibula should be suspected whenever ankle injury results either in lateral talar displacement or tibiofibular widening without distal fibular fracture or in a seemingly isolated posterior malleolar fracture. The presence of maisonneuve fractures implies a ligamentous ankle injury with potential instability not apparent on static radiographs. If a patient presents with fibular fracture, doctors should always get



# Occult Ankle Injuries

Continued from page 3.

full leg x-rays including the knee and ankle. This way, the ankle injury will not be missed.

Deltoid ligament and syndesmotic injuries can also be missed. After an injury is sustained, the deltoid ligament may rupture and return to its normal position. Widening may not be readily apparent on x-rays. Because of this anomaly, it's important to get stress views and external rotation views of the ankle. With these views, doctors will be able to determine if deltoid ligament and syndesmotic injuries have been sustained.

Another commonly missed ankle injury is a posterior tibial tendon rupture. These injuries should strongly be suspected if an adult patient presents with a history of a twisting ankle injury, especially in the setting of a high-impact load, and generalized swelling and pain over the medial ankle. This injury occurs with increased frequency in the geriatric population. The posterior tibial tendon is essential to internal rotation of the foot and walking on toes. Delayed diagnosis can cause fixed bony planus and necessitate difficult hind foot fusion rather than simple soft tissue repair.

## June Word Search

K	C	I	T	O	B	O	R	K	T	G	C	V	E	W
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MAISONNEUVE  
 DELTOID  
 SYNDESMOTIC  
 ANKLE  
 TALAR  
 FIBULA  
 ROBOTIC  
 FLUOROSCOPY  
 TELEOPERATION

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### ORTHOPAEDIC MONTHLY

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

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