New program focuses on hip preservation
Early, less-invasive treatment gives teens, young adults new options

Le Bonheur Children’s and Campbell Clinic recently formed a Hip Preservation Program, treating adolescents and young adults with hip problems. The comprehensive program aims to diagnose and treat early symptomatic hip conditions in order to delay or prevent total hip replacement or arthritis.

While childhood hip disorders such as dysplasia, Perthes and slipped epiphysis aren’t new, Campbell Clinic and Le Bonheur physicians are now offering some new and innovative treatment alternatives with positive outcomes to address these and other hip deformities.

“There is a new field in orthopaedics that allows us to diagnose and treat children and young adolescents with hip disorders that benefit from ‘hip preservation,’” said Le Bonheur/Campbell Clinic Pediatric Orthopaedic Surgeon James Beaty, MD. “This means we treat hip problems that would normally lead to early arthritis of the hip. We try to preserve complete use of their hip and delay the risk and onset of early arthritis of the hip.”

The spectrum of treatment for hip preservation includes diagnosis, conservative non-surgical treatment and arthroscopic surgery of the hip. The program focuses on using less-invasive techniques like arthroscopy to treat hip conditions when possible. Other larger open operations like periacetabular osteotomy, acetabuloplasty and proximal femoral osteotomy are also provided when needed.

The hip preservation team includes adult and pediatric orthopaedic surgeons whose expertise ranges from congenital defects to sports-related hip injuries. It also includes radiologists, physical therapists and nurse practitioners experienced in diagnosing and treating hip conditions in a pediatric population.

“We have the knowledge and training to both diagnose and treat the full spectrum of adolescent and young adult hip disease,” said Beaty.

Le Bonheur hip patient, 14-year-old Claire Whitaker of Olive Branch, Miss., experienced severe hip pain after eight years of playing competitive soccer. When Claire finally sought medical attention for her pain, she and her family were surprised to learn that what they thought was a pulled muscle was actually a torn labrum caused by hip dysplasia. Claire was offered surgery to fix the problem. (See full story on Page 3.)

“Although Claire had been experiencing symptoms for a year, it was fortunate that she was referred to us early in the disease process before she sustained severe hip cartilage damage,” said Derek Kelly, MD, who performed Claire’s surgery. “It was our hope that labral repair and reorientation of Claire’s acetabulum will prevent her from developing arthritis at a young age.” She was back to practicing with her team eight weeks after surgery.

Hip preservation research also continues to grow. Kelly is part of the International Perthes Study Group – a multicenter research study evaluating Perthes in children. Legg–Calvé–Perthes disease (Perthes) occurs when loss of blood supply to the femoral head leads to collapse or deformity of the hip joint. The study group has prospective study protocols currently in place for children ages 6-8 and ages 8-11. The group hopes to discover the utility of new diagnostic tools such as perfusion MRI and new treatments such as injectables or prolonged weight-bearing restriction.

“By formalizing a hip preservation center and studying the latest techniques and approaches to adolescent and young adult hip problems, we hope to continue to advance the field of orthopaedic and improve the outcomes of our patients for years to come,” said Pediatric Orthopaedic Surgeon David Spence, MD.
Researchers evaluate use of MRI in diagnosing spondylolysis

MRI is an effective tool for diagnosing pars stress reactions and fractures, according to a recent Le Bonheur and Campbell Clinic study.

Pediatric orthopedic surgeons looked at different imaging modalities for diagnosing spondylolysis, a defect or stress fracture of the vertebrae. The researchers aimed to determine the effectiveness of MRI when it comes to detecting this condition.

The study included 26 patients with a presumptive diagnosis of spondylolysis who each had both a CT scan and an MRI scan within 30 days of each other. Researchers reviewed the patients’ clinical and radiographic data, comparing MRI and CT images for presence of the fracture.

Of 39 pars lesions (stress reaction or fracture), MRI was effective in identifying 36, or 92 percent. Additionally, MRI identified 11 lesions in nine patients with a negative CT.

MRI has been very useful in the early detection of spondylolysis or a stress fracture of the vertebrae. A unique finding from the study was the finding of 11 lesions or stress reactions that did not show a fracture on CT. Researchers believe these stress reactions occur prior to definitive fracture and have allowed for early treatment.

Study compares operative vs. non-operative treatment of medial epicondyle fractures of the humerus

Medial epicondyle fractures of the humerus treated non-operatively can result in radiographic deformity and instability, according to researchers at Le Bonheur Children’s. The research compared clinical and radiologic outcomes of medial epicondyle fractures that were treated operatively versus fractures treated non-operatively.

Treatment of such fractures of the distal humerus in the pediatric population remains controversial. Most physicians agree that non-displaced fractures are best managed non-operatively, while fractures with entrapped fragments and open fractures are best treated operatively.

This leaves a subset of fractures — displaced, but not incarcerated — in which the preferred treatment remains unknown,” said Derek Kelly, MD, a pediatric orthopaedic surgeon with Le Bonheur and Campbell Clinic and a lead investigator on the study.

Medial epicondyle fracture patients (31 total) were subdivided into three groups for the study: non-displaced fractures; incarcerated fragments; and displaced but not incarcerated fractures (which were further divided into operative and non-operative subgroups).

Non-displaced fractures were treated non-operatively; incarcerated fragments were treated with surgery. Of the 21 fractures in the third subgroup, 14 were repaired operatively, and seven were treated non-operatively. Average follow up for the study patients was just more than four years.

Clinical outcomes were assessed with a follow-up exam and the Japanese Orthopaedic Association elbow assessment score. Final follow-up radiographs of the injured and contralateral elbow were reviewed to identify bony union, width of the humerus and the vertical position of the medial epicondyle. Valgus stress radiographs were also obtained and compared to the contralateral elbow to assess elbow instability.

Results showed both operative and non-operative treatment of this subset produced good outcome scores and high union rates, but there were more radiographic deformities and instability in the displaced, non-operative group.

Surgeons compare inter-, intra-observer variability for femoral shaft fractures

Researchers at Le Bonheur and Campbell Clinic have found considerable inter- and intra-observer variability in the classification of femoral shaft fractures in children younger than 3 years. Classification of such fractures is an important part of evaluating young children for possible non-accidental trauma.

“Orthopaedic surgeons are part of a multidisciplinary team responsible for the diagnosis and treatment of children with non-accidental traumatic injuries,” said Jeffrey R. Sawyer, MD, a Le Bonheur/Campbell Clinic pediatric orthopaedic surgeon and one of the study’s lead investigators. “Effective communication between all team members is essential given the tremendous impact making the correct diagnosis of non-accidental trauma has on patients and their families.”

The Le Bonheur study looked at classification of femoral shaft fractures according to three groups with varied training and background: orthopaedic surgeons, emergency room physicians and musculoskeletal radiologists. Years of experience and training were also taken into consideration for the study.

The researchers identified children ages 3 years or younger with a closed femoral fracture between 2005 and 2011. A formulized ratio was used to standardize the images and eliminate variability due to error. Fifty radiographs fit the inclusion criteria for the study.

Fourteen different reviewers — seven orthopaedic surgeons, five emergency room physicians and two musculoskeletal radiologists — reviewed each patient’s AP and lateral radiographs. Observers classified each fracture as transverse, oblique or spiral. A second review, with images presented in a different order, was performed at least 10 days later.

Results showed that the ability of different specialists to reproducibly classify pediatric femur fractures is highly variable. Intra-observer reliability was stronger than inter-observer reliability, perhaps suggesting the characterizing features of each fracture are not shared among the different specialties.

Nurse practitioners conduct research, present

Work from Le Bonheur’s orthopaedic nurse practitioners is contributing to advancements in the field. Most recent published research and presentations include:

Rhodes, L. National Association of Pediatric Nurse Practitioners, 34th Annual Conference, April 2013. Podium Presentation “Ovarian Injuries: A Pain in My Heart”

Rhodes, L. Society of Pediatric Nurses, March 2013 meeting, Podium Presentation “Pediatric Sexual and Physical Assault.”


Le Bonheur Children’s Hospital, Nursing Grand Rounds, November 2012. Poster presentation: “Does a pre-operative tour alleviate anxiety in patients having posterior spinal fusion surgery?”

Southwest Community College, Guest Lecturer, September & November 2012. Presentations: “Pediatric Sexual Assault.”


Scott D., Le Bonheur Orthopaedic Research Update. A formulized ratio was used to standardize the images and eliminate variability due to error. Fifty radiographs fit the inclusion criteria for the study.


Rhodes, L. Piloted presentation: Does a pre-operative tour alleviate anxiety in patients having posterior spinal fusion surgery? Presented at the Le Bonheur Children’s Hospital, Nursing Grand Rounds, November 2012.

Rhodes, L. Pediatric Sexual Assault. Southwest Community College, Guest Lecturer, September & November 2012.

Rhodes, L. Pediatric presentation: Anxiety in posterior spinal fusion for adolescents with scoliosis. Presented at the annual Le Bonheur Children’s Hospital Pediatric Certification Review Course, June 2013.

Scott D. Pedod Nurse presentation: Pediatric Septic Arthritis. Le Bonheur Children’s Hospital, Nursing Grand Rounds, April 2012.


Scott D. Roundtable discussion: What are We Doing About Childhood Obesity in Pediatric Orthopedics? Tennessee Nurses Association Annual Convention, Nashville, Tenn., October 2012.

Le Bonheur Children’s was one of four sites chosen to host the European Paediatric Orthopaedic Society’s 2013 Traveling Fellows. The EPOS Traveling Fellowship sends three emerging leaders in the field of pediatric orthopaedic surgeons to different U.S. centers every other year to expand their knowledge and build collaboration in the field. On alternate years a team of U.S. surgeons is hosted by surgeons at leading European centers.

Le Bonheur Pediatric Orthopaedic Surgeon Jeffrey R. Sawyer, MD, is a former traveling fellow whose site visits included Helsinki, Finland; Dusseldorf, Germany; Vienna, Austria, and Warsaw, Poland. This year’s fellows spent three days in April at Le Bonheur meeting with the Campbell Clinic/Le Bonheur pediatric orthopaedic team.
Andrew Greenland: Trauma
Four-year-old Andrew Greenland is a star on his local baseball team. He does not even use a tee. It’s hard to tell that only one year ago Andrew was in a lawn mower accident that severely injured his left arm.

“I rushed home from work after I got the call Andrew was hurt,” said Heather. “When I got to him, I could see how badly his arm was mangled.”

Andrew had fallen off his grandparents’ riding lawn mower, and the blades ran over his left arm.

Heather and her husband, Wesley, both nurses, helped paramedics wrap and put pressure on the wound before a helicopter arrived to transport Andrew from Munford, Tenn., to Le Bonheur Children’s Hospital in Memphis.

Andrew was admitted to the Pediatric Intensive Care Unit; doctors were not sure if they could save his arm.

According to Le Bonheur Pediatric Orthopaedic Surgeon James Beaty, MD, Andrew had a significant injury with loss of his elbow joint surface and muscle, as well as the skin and nerves around the elbow and forearm.

“I was so impressed that almost as soon as we got to Le Bonheur, orthopaedic surgeons were in our room, telling us he would be OK. They laid out a detailed plan of how they were going to save his arm,” said Heather.

Andrew remained at Le Bonheur for 23 days and underwent a total of eight surgeries to repair his arm. Operations included external fixation and several other orthopaedic and plastic reconstructive surgeries. Andrew remained in external fixation for six weeks.

He also underwent intense physical therapy for three months, continuing his rehabilitation after discharge.

Today, Andrew is doing well. He has limited elbow motion but almost complete use of his wrist. Now 4, Andrew is able to play baseball, his favorite sport, five days a week. Andrew and his family still travel to Le Bonheur for checkups with the orthopaedic and plastic surgery teams.

“We are pleased and proud to see Andrew’s progress and outcome now from a year ago,” said Beaty. “The joy for their family after a tough injury is the reason we do what we do.”

Claire Whitaker: Peri-Acetabular Osteotomy
Claire Whitaker, 14, of Olive Branch, Miss., thought the pain she was feeling in her left hip was normal wear-and-tear from playing eight years of competitive soccer. She had been feeling the sharp pain for about three months.

“We thought it was a minor muscle injury,” said her father, Whit Whitaker.

Eventually the pain grew worse and began to slow her down in soccer games and practices. She went to see doctors at Campbell Clinic in Memphis, Tenn., in January 2013 and was diagnosed with bilateral hip dysplasia and a left hip labral tear, which was detected using MRI arthrogram.

“We discussed many treatment options and decided on a Bernese (Ganz) Peri-Acetabular Osteotomy with simultaneous open labral repair using suture anchors,” said Le Bonheur/Campbell Clinic Pediatric Orthopaedic Surgeon Derek Kelly, MD.

“This approach was chosen because it allows us to correct both of her problems in the same setting.”

Doctors performed a labral repair through a T-shared capsulotomy using two suture anchors before performing the osteotomy.

They used an abductor muscle-sparing technique and stabilized the osteotomy with a number of 3.5-mm screws.

The operation was a success. Claire’s center-edge angle improved from 19 to 30 degrees, and she was able to walk without crutches six weeks after the operation.

Her recovery came just in time for soccer tryouts. Claire made her high school’s varsity team this spring and will be able to participate in some drills at camp this summer.

“We are glad that Claire has done so well in the short term. She is a fast healer and was able to get back to her activities very quickly. But we are also hopeful that this surgery will protect Claire’s hip for the long term and hopefully delay or prevent the development of severe osteoarthritis,” said Kelly.


