**Case Study: Grace Bennett, 14**

**Grade 3B open femur fracture**

Grace Bennett, 14, of Germantown, Tenn., was close to losing her left leg after an all-terrain vehicle (ATV) accident in November. Her mom, Shelby Bennett, was at the grocery store with her younger daughter when she got the call.

“She had spent the night with a friend,” said Shelby. “They told me, ‘Get here right now. Something’s happened to Grace.’”

Her friend’s mom and a doctor — who was nearby and happened to hear the accident — applied a tourniquet to stop the bleeding, while they waited for paramedics to arrive. Grace was airlifted to Le Bonheur Children’s Hospital.

Grace suffered extensive soft tissue injury with a Grade 3B open femur fracture, said Le Bonheur/Campbell Clinic Pediatric Orthopaedic Surgeon Derek Kelly, M.D. Her quadriceps mechanism and a large portion of her adductor compartment was disrupted. She also had extensive bone and muscle tissue loss. Her femoral artery and sciatic and femoral nerves were intact.

“She stood a very good chance of losing her leg,” said Kelly.

Surgeons performed two surgeries to clean out and debride the dead tissue and bone to avoid infection. They also placed a temporary spanning external fixator during the first surgery to stabilize the injury.

Grace required two more surgeries, including a femoral rodding with masquelet technique for a 9 centimeter bone loss defect. She also had a muscular and fascial repair of her quadriceps. Then, four weeks later, surgeons performed a bone grafting of the site following contralateral RIA bone graft harvest and removal of the bone cement spacer.

Today, seven months after her accident, Grace is healing well. She still uses crutches to walk and does physical therapy twice a week to regain strength and function of her left leg.

“All in all she is doing great,” said Kelly. “She has thus far avoided infection, and she has managed to heal part of her bone loss defect. Her rehab has been amazing, particularly considering that she had complete disruption of her quadriceps muscles with loss of tissue.”

Grace, who started high school in August, continues to follow up in clinic every four to six weeks.

**Case Study: Greg Smith, 16**

**C7 burst fracture, T1 compression fracture, cord compression**

Greg Smith, 16, of Pontotoc, Miss., was returning home from a crawfish boil with a friend when their SUV hit a sudden sharp turn and rolled over. Greg managed to climb out of the vehicle from the passenger’s seat.

“A lady who happened on the scene called me and told me he’d been in an accident, but that both boys were OK,” said Greg’s mom, Kristan Walker.

A CT scan at the nearest hospital revealed that Greg had a C7 burst fracture. He was transferred to Le Bonheur Children’s Hospital, where further evaluation showed that Greg also had a small compression fracture of the T1 vertebra, as well as cord compression and gross instability.

“They told me it was a miracle he wasn’t paralyzed,” Kristan said.

Less than 48 hours after the accident, Orthopaedic Surgeon Jeffrey Sawyer, M.D., and Neurosurgeon Michael Muhlbaier, M.D., performed a C7 corpectomy to implant a Veritask spineal system, with the use of local autograft and allograft — as well an anterior cervical plating of C6-T1.

In a second surgery four days later, Orthopaedic Surgeon William Warner, M.D., with neurosurgeon Michael Muhlbaier, performed a posterior spinal instrumentation fixation of C6-T1 in three segments with vertex lateral mass pedicle fixation.

After a 10-day hospital stay, Greg was able to return home, but remained in a neck brace for nearly three months as he healed. He’s continued to follow up with both his pediatric neurosurgeon and pediatric orthopaedic surgeon at Le Bonheur to monitor his progress.

Greg, an active member of his school’s band, was able to participate in band camp in July — one of his biggest goals for his recovery.
Kelly travels Europe as POSNA fellow

Le Bonheur/Campbell Clinic Pediatric Orthopaedic Surgeon Derek Kelly, MD, was one of three surgeons selected for the Pediatric Orthopaedic Society of North America’s (POSNA) traveling fellowship. Each year three POSNA members travel abroad, and three members of an international alliance society tour in North America.

Kelly visited four European medical centers and attended the annual European Pediatric Orthopaedic Society (EPOS) meeting in Rome.

Canale retires, receives prestigious Tipton Award

S. Terry Canale, MD, former professor and chair of the University of Tennessee-Campbell Clinic Department of Orthopaedic Surgery, recently retired after nearly 50 years of service to his patients and profession.

In March, Canale received the 2016 William W. Tipton Jr, MD, Leadership Award from the American Academy of Orthopaedic Surgeons (AAOS). Canale has served as former president for both the AAOS (2000-2001) and the Pediatric Orthopaedic Society of America (POSNA) (1989-1990). Canale was also the editor of AAOS News.

“Terry is one of those individuals who, when recognized by his peers and put in a position of leadership, has not only actually done the job, but also has added vision and innovation and successful new ventures to every organization with which he has been involved,” wrote current professor and chair of the Department of Orthopaedic Surgery James Beaty, MD, in his nominating letter.

Beaty named department chair for Orthopaedic Surgery, Biomedical Engineering

James H. Beaty, MD, a Le Bonheur/Campbell Clinic pediatric orthopaedic surgeon, has been named chair of the University of Tennessee-Campbell Clinic Department of Orthopaedic Surgery and Biomedical Engineering in the College of Medicine at the University of Tennessee Health Science Center (UTHSC). He was also awarded the Harold B. Boyd, MD Professorship in Orthopaedic Surgery. Beaty, a UTHSC alum, is the ninth department chair since its founding in 1911.

Sawyer to serve as pre-course director at 2017 EPOSNA meeting

Nearly 2,000 physicians are expected to attend the joint 2017 European Paediatric Orthopaedic Society (EPOS)/Pediatric Orthopaedic Society of North America (POSNA) Annual Meeting in Barcelona May 3-6, 2017. Le Bonheur/Campbell Clinic Pediatric Orthopaedic Surgeon Jeffrey Sawyer, MD, was selected to chair the pre-course on “Cutting Edge Pediatric Orthopaedic Care: The North American and European Perspective.” Sawyer also serves on the POSNA board of directors.

Rhodes receives Excellence in Advanced Practice award

Leslie Rhodes, NP, recently received the 2016 Society of Pediatric Nursing’s (SPN) national Excellence in Advanced Practice Award. The award recognizes an advanced practice nurse who has made a significant contributions to the care of children and their families. Rhodes is part of Le Bonheur’s Pediatric Orthopaedic team and also serves as secretary of the Mid-South chapter of SPN. The award was presented at the SPN conference in April in Minneapolis.

Locke awarded for Best Poster at POPS conference

Orthopaedic Nurse Practitioner Lindsey Locke, NP, received a “Best Poster” award at the 2016 Pediatric Orthopaedic Practitioner Society (POPS) annual conference. For her study, “Evaluation of Nursing Education on the Utilization of a Pain Algorithm,” Locke worked with a multidisciplinary team to help facilitate communication between providers and nurses to better control patients’ pain.

Fellowship Spotlight: Marielle Amoli, MD

Fellow Marielle Amoli, MD, fell in love with pediatric orthopaedics during her final year of medical school. A month-long rotation with the Le Bonheur/Campbell Clinic team left Amoli ready to pursue the specialty as a career.

“I instantly, I loved the variety of procedures and children you see. I wanted the ability to help them,” said Amoli.

After completing medical school at the Medical College of Georgia, Amoli was accepted into the University of Florida-Jacksonville’s orthopaedic surgery residency program. After completing the program, she knew she wanted to return to Le Bonheur/Campbell Clinic for further training in pediatrics.

“I knew I wanted to come back here ever since my first experience with Le Bonheur/Campbell Clinic as a medical student,” said Amoli. “All of the attendings are wonderful and fully committed to patient care and resident/fellow teaching.”

Upon completing her fellowship, Amoli plans to return to Jacksonville, Fla., to work as a pediatric orthopaedic surgeon at Nemours Children’s Clinic.

“I’m excited to get back home, but will miss everyone I’ve met and had the opportunity to work with here. I plan on incorporating everything I’ve learned here both in the OR and the clinic into my practice back in Florida,” said Amoli.
Orthopaedic Society of North America (POSNA) annual patients ages 12 and younger (967 patients) who were adherence to the CPG among centers. considerable variability in treatment method and 11 years old and a trend toward surgical treatment in locked intramedullary nailing in patients younger than Acade my of Orthopaedic Surgeons (AAOS) released its nearly 2,700 pediatric femoral shaft fractures in a 10-year presented at the POSNA annual meeting in April. Podium presentations included: “Factors that predict instability in pediatric diaphyseal both-bone forearm fractures” Age, initial translation, complete fractures of the radius and residual translation on follow-up are all factors that predict need for a repeat procedure in pediatric patients with diaphyseal forearm fractures. Researchers looked at radiographs and records of 188 patients (174 with adequate follow-up) with closed reduction and cast- ing of diaphyseal forearm fractures in the emergency department to determine what factors may predict failure of initial closed reduction and casting. Demographic, time course and radiographic data were evaluated at presentation and at varying intervals until union was achieved. Risk factors for repeat reduction include: • Fractures translated 50 percent or more in any plane • Age greater than 9 years • Complete fracture of the radius • Follow-up angulation of the radius of more than 15 degrees on lateral radiographs • Follow-up angulation of the ulna of more than 10 degrees on anteroposterior radiographs • Translation of either bone of more than 50 percent at follow-up

“Pediatric femur fracture management: A multicenter analysis of the trends pre and post 2009 AAOS Clinical Practice Guidelines” Results of a multicenter study analyzing treatment of nearly 2,700 pediatric femoral shaft fractures in a 10-year period show a continued trend toward operative management of femoral shaft fractures in younger children. The study looked at treatment of such fractures five years before and five years after (2004-2013) the American Academy of Orthopaedic Surgeons (AAOS) released its Clinic Practical Guidelines (CPG) in 2009. After 2009, data showed significant increases in locked intramedullary nailing in patients younger than 11 years old and a trend toward surgical treatment in patients younger than 5 years old. The study revealed considerable variability in treatment method and adherence to the CPG among centers.

“Child safety restraint status and age in motor vehicle collisions predict type and severity of traumatic injuries” Researchers retrospectively reviewed charts for patients ages 12 and younger (967 patients) who were treated after a motor vehicle collision (MVC) to evaluate the relationship between childhood MVC injuries, age and restraint status. Age groupings were established in accordance with the state’s child safety restraint laws. Restraint status groupings were also assigned to each patient based upon the trauma registry data. Data analysis was performed with cross tables and a Chi Squared Test. The study found that: • 4-8-year-olds were most commonly improperly restrained • No statistical difference was observed for orthopaedic injuries among restraint status groups • Internal thoracic injuries, open head wounds and open upper-extremity wounds were most common injuries in improperly and unrestrained patients • Upper-extremity fractures, femur fractures, dislocations and spinal fractures were significantly higher in older age groupings. • Improperly restrained infants had higher occurrences of intracranial bleeds and abrasions

Research Spotlight: 2016

The Le Bonheur/Campbell Clinic Pediatric Orthopaedic team delivered several podium and poster presentations at the 2016 Pediatric Orthopaedic Society of North America (POSNA) annual meeting in April. Podium presentations included: “Factors that predict instability in pediatric diaphyseal both-bone forearm fractures” “Complications and radiographic outcomes of posterior spinal fusion (PSF) and observation (OBS) in patients who have undergone distraction-based treatment for early onset scoliosis (EOS)” Observation, in select patients, at the end of distraction gives similar radiographic and spine height outcomes as patients who undergo posterior spinal fusion (PSF), which has a much greater complication rate. Researchers reviewed data from the Children's Spine Study Group database for 37 patients who underwent observation (12 patients) or PSF (25 patients) at the end of distraction to compare radiographic and spine length parameters and complications. Findings include: • The most common EOS diagnosis was C3. • Mean age of initiation of distraction was 4.2 years in both groups. • The groups were similar in terms of ambulation and device (rib-based 100 percent PSF, 84 percent OBS). • While PSF led to initial improvement in radiographic and length/height, at final follow-up, there was no significant difference between the groups in terms of Cobb angle/kyphosis and T1-T12 height/length. • The groups were similar radiographically, and OBS patients achieved 90 percent T1-1.1 length as PSF. • There were 62 and 0 complications in the PSF/OBS groups. Further study is necessary to determine factors predictive successful long term observation.

Comparison 2014 to 1998 | Results of the AAP’s orthopaedic workforce survey

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<th>FOPE II study</th>
<th>2014 AAP/POSNA survey</th>
<th>Change</th>
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<tr>
<td>Female participants</td>
<td>8%</td>
<td>23%</td>
<td>15%</td>
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<tr>
<td>Hours worked</td>
<td>62 hours</td>
<td>60 hours</td>
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<tr>
<td>Work in University/ academic setting</td>
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<td>30%</td>
<td>-25%</td>
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<tr>
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<td>74%</td>
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<tr>
<td>Local competition with pediatric orthopedic surgeons</td>
<td>71%</td>
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Ortho recognized by U.S. News & World Report

U.S. News & World Report has again named the Le Bonheur/Campbell Clinic pediatric orthopaedic team as one of the nation’s best programs. The 2016-17 Best Children’s Hospital rankings were released June 21.

“The U.S. News designation is further proof that Le Bonheur provides world-class pediatric health care to children in Memphis, the region and the country. This badge means that parents can trust that our experts work every day to be one of the best children’s hospitals in the country,” said Le Bonheur President and CEO Meri Armour. “We use the U.S. News survey standard as a tool to continually advance the level of our pediatric care. We are honored that Le Bonheur has been recognized seven of the nine categories in which we could apply.”