Limb Deformity Program Tackles Rare Surgeries for Pediatric Patients with Congenital, Developmental and Acquired Deformities

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The goal is to present families with a range of available surgical and non-surgical options, many of which have only been introduced within the last five years. These include alternatives to amputation, bracing, joint and limb reconstruction, plastic surgery, prosthetics or orthotics – or a combination of techniques designed to help the child gain maximum functionality and confidence.

“A lot of the children who have congenital problems here are already involved in other programs,” explains Dr. Ruggles, who is also a clinical assistant professor of Orthopedic Surgery at The Ohio State University. “The nice thing about being here is that we have every sub-specialty that children with these congenital problems need. Every department can stay on the same page and provide total care when it comes to these children.”

After joining the Department of Orthopedics in March of 2013, Dr. Ruggles became one of the first surgeons in Ohio to use a new magnetically controlled lengthening nail, specifically designed for pediatric patients, to perform limb-lengthening surgery on three children with congenital malformations at Nationwide Children’s. This technology may also be a treatment option for other conditions, such as deformities caused by neuromuscular diseases or trauma injuries.

“This is probably one of the biggest orthopedic advances I’ve seen for young children who need limb lengthening,” says Dr. Ruggles. “Ideally, any large pediatric hospital would have this program, but it’s just not that common. We can offer something here that can’t be found elsewhere.”
ORTHOPAEDICS

The Department of Orthopaedics at Nationwide Children’s Hospital provides diagnosis, evaluation, and treatment for all orthopaedic conditions and disorders in infants, children, and adolescents. Inpatient, outpatient, and emergency services are provided to patients with a wide range of developmental, congenital, neuromuscular, and posttraumatic problems of the musculoskeletal system, trauma and fractures, scoliosis, and other spinal abnormalities.

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The Department of Orthopaedic Surgery faculty participate in the education of health care professionals at several levels. Residents, medical students, and nurses from The Ohio State University, Ohio Health, and Mount Carmel Health System receive all of their pediatric orthopaedic experience at Nationwide Children’s Hospital. The Accreditation Council for Graduate Medical Education (ACGME)-accredited fellowship program rounds out the extensive educational program. Surgical and nonsurgical expertise includes:

- Clubfoot
- Fractures, pediatric trauma and fracture care
- Neuromuscular disorders, including cerebral palsy and myelomeningocele
- Scoliosis and spinal disorders
- Musculoskeletal tumors
- Pediatric hand and foot disorders
- Limb length discrepancy
- Bone and joint infections
- Pediatric and adolescent sports medicine
- Pediatric and adolescent hip deformity reconstruction including developmental hip dysplasia, Legg-Calve-Perthes disease
- Slipped capital femoral epiphysis
- Pediatric congenital hand conditions

Research interests continue to expand within several areas of the Department of Pediatric Orthopaedics. With the appointment of Allan Bebe, MD, as director of pediatric orthopaedic trauma, research initiatives related to pediatric fracture care resulted in publications that may change the management of supracondylar humerus fractures, pediatric femur fractures, and both bone forearm fractures. A novel technique of submuscular femoral plating for length-unstable femur fractures has shown excellent outcomes. Now published, results for a large cohort of patients have shown patients to heal, walk, and return to sports quicker and without the complications seen with previous techniques. Sports medicine-directed research included publications describing improved outcomes for patients treated surgically for multifocal osteochondritis dissecans of the knee and the benefit of femoral nerve blocks for outpatient arthroscopy. Collaborative efforts with the departments of anesthesiology and interventional radiology resulted in several publications highlighting intraoperative care of complex spinal fusion patients and percutaneous treatment of aneurysmal bone cysts, respectively.

Numerous presentations were made within local, regional, national, and international settings, including a talk entitled “Treatment of acute, unstable Slipped Capital Femoral Epiphysis (SCFE) via the modified Dunn procedure.” This presentation highlighted the largest group to date treated by a single surgeon with this procedure. Outcomes revealed a 6.9 percent avascular necrosis (AVN) rate and normalization of radiographic hip parameters.

In November 2014, the department teamed with the Division of Sports Medicine to hold its second annual Sports Medicine and Orthopaedics Conference at Nationwide Children’s Hospital. Over 200 participants, including pediatricians, physical therapists, athletic trainers, and general orthopaedists from Ohio and nearby states attended this full-day conference that offered sessions on a wide variety of sports and orthopaedic topics.

Educational initiatives continue to grow as our ACGME-accredited program now trains approximately 50 rotating residents and fellows per academic year. The educational program includes a daily trauma conference, a weekly reading and X-ray conference, a pre-op indications conference, a surgical milestones conference, morbidity and mortality, current literature, research meetings, and a monthly fellow’s conference. Pediatric orthopaedic grand rounds and a pediatric-specific lecture series is conducted on a monthly basis, 10 months per year. The Ohio State University Orthopaedic Surgery residents elected Residency Program Director Walter Samora, MD, “Educator of the Year.” He continues to strive to develop a rich academic environment for all residents, fellows, and students that rotate through our program. They have an opportunity to participate in specialty clinics such as hand, trauma, spine, trauma, cerebral palsy, myelomeningocele, and limb deformity. Three free-standing clinic locations allow for a diverse population of patients.

The department continues to show growth in clinical and surgical volumes, academic productivity, and surgical innovation within several areas. In pursuit of innovative treatment for all patients, the expertise of Dan Ruggles, DO, has brought new surgical techniques for the management of congenital limb deformity, leg length discrepancy, and complex trauma conditions. Additionally, he was part of the teaching faculty at the Baltimore Limb Deformity Conference held in September 2013. Matthew Beran, MD, has expanded the treatment of pediatric and adolescent athletes with newer techniques in anatomic anterior cruciate ligament (ACL) reconstruction, and elbow and shoulder arthroscopy.
PUBLICATIONS


FAST FACTS

**July 2013 – June 2014**

**Inpatient Discharges:** 577

**Observation and Outpatient-in-a-Bed Discharges:** 498

**Total Discharges:** 1,075

**Average Length of Stay:** 2.9

**Average Daily Census:** 4.5

**Patient Days:** 1,654

**Total Surgical Cases:** 2,214

**Inpatient Consults:** 1,599

**Dublin Orthopaedic Clinic Visits:** 7,584

**East Broad Orthopaedic Clinic Visits:** 418

**Orthopaedic Clinic Visits:** 16,645

**Orthopaedic Oncology Clinic Visits:** 112

**Westerville Orthopaedic Clinic Visits:** 12,145

**Total Orthopaedic Clinic Visits:** 36,904

*Excludes observation and outpatient-in-a-bed patients.*