OHSU Department of Orthopedics and Rehabilitation

Rotation Specific Objectives for Resident Education

Rotation: Shriners Hospital Resident year-in-training: PGY2

Attending Physicians:

1. Michael Aiona, MD

2. Ivan Krajbich, MD

3. Michael Sussman, MD

4. Dennis Roy, MD

5. Heather Kong, MD

6. Ellen Raney, MD

7. Jeremy Bauer, MD

8. Michelle Welborn, MD

9. Krister Freese, MD

10. Daniel Bouton, MD

11. Robert Bernstein, MD

12. Kathryn Fuchs, MD

Primary Objective:
Surgical and medical training related to orthopedic injury and conditions in children and adolescents including congenital, acquired, neuromuscular, developmental and traumatic conditions affecting the musculoskeletal and integumentary systems in the appendicular skeleton and spine.

Educational Philosophy:
The goal and objective of our pediatric orthopedic program is to educate the resident so they will be able to function as an independent pediatric orthopedist. The first step is to ensure that they acquire basic knowledge of pathophysiology and pathoanatomy of pediatric orthopedic conditions. The second phase is to help them develop their problem-solving skills in regards to patients. The emphasis is on the process, rather than particular cookbook solutions to problems. We have a diverse staff, which ensures a spectrum of concepts and approaches to

treatment and the resident is encouraged to recognize that there are, in most conditions, several approaches to treatment.

Residents will be exposed to a large volume of secondary and tertiary pediatric orthopedic problems, covering the whole spectrum of elective pediatric orthopedic practice. Extensive exposure to diagnosis and treatment, including the latest techniques of spinal deformities, pediatric neuromuscular disorders, skeletal dysplasia, limb deficiencies, hip and foot disorders, upper extremity disorders and musculoskeletal oncology can be anticipated. There is a fully automated motion and gait analysis laboratory, which provides clinical studies on all appropriate patients. There is a strong clinical research program as well as a 50-member basic science institute with focus on connective tissues.

Rotation Expectations and Opportunities:

At the Shriners Hospitals for Children the orthopedic resident will work primarily with multiple pediatric fellowship trained orthopedic surgeons.

Current Rotation; The PGY2 spends 10 weeks dedicated to pediatric orthopedic surgery. This rotation encompasses a 5-day week. Each resident spends time (10-20% or 0.5-1 days/week) dedicated to service-related educational activity and self study (e.g. preparing conferences, review case records, independent study and research investigations). On average, the resident will also take call on 2 out of every 4 weekends a month, responding to patient phone calls and managing ward patients.

Shriner's Hospital rotation schedule (current)

Monday – OR/clinic
Tuesday – OR/clinic
Wednesday – pediatric conference, then OR/clinic
Thurs – AM - Shriners lectures, clinic vs independent study, PM - indications conference, gait lab
Fri – OR/clinic

The PGY2 is one of a few trainees at the Shriner's hospital. There are 3 fellows present as well as a PGY3 from a neighboring residency in Corvallis. There are more attendings than residents, which ensures a directed one on one experience for all trainees.

There is a weekly conference at Shriner's hospital in addition to a conference at OHSU on Wednesdays once a month. These conferences are topic-based conferences and are often centered around a pertinent case. In addition, there are 2 general conferences a year at the Shriners Hospital with a nationally recognized guest speaker.

Generalized Rotation Goals & Mechanisms:

Didactic:

- A formal pediatric orthopedic attending/resident weekly conference to specifically address topics in pediatric orthopedic surgery. Residents will deliver an hour-long presentation on an attending-approved pediatric orthopedic topic.
- A weekly case-based conference
- Pre, mid and post-rotation meetings to assess expectations and progress of residents.
- Journal club every 6 weeks at Shriners Hospital. There is also a journal club once a year that is combined with OHSU pediatric orthopedics.

Patient Care:

- Attain competence in performing a comprehensive evaluation of new and return patients with chronic conditions in clinic. Comprehensive and concise history, physical examination, and diagnostic test ordering and interpretation are emphasized. This includes:
    - Performing a thorough history & physical examination
    - Ordering appropriate studies/consults
    - Developing a differential and making a final diagnosis when appropriate
    - Initiating therapeutic non-operative (including PT/OT, medication and/or bracing) or surgical interventions
- Thorough and concise management of post-operative patients during their inpatient stay.

Medical Knowledge:

At the conclusion of a rotation, each resident is expected to have a basic understanding of:

- common newborn and congenital orthopedic conditions
- common developmental variants and physiologic development of the maturing musculoskeletal system
- pediatric spine conditions including deformity and degenerative conditions
- common overuse injuries
- common pediatric benign musculoskeletal neoplasms
- the differences between the developing and mature skeleton
- At the Shriners Hospital there is special expertise in the following:
    - Scoliosis/kyphosis and other spinal abnormalities and conditions, including thoracoscopic, vertebral body tethering, and magnetic expansion control system for these deformities
    - Idiopathic, neuromuscular, and congenital clubfoot; other foot deformities; tarsal coalition
    - Congenital pseudoarthrosis of the tibia and other bones
    - Spina bifida/myelodysplasia
    - Skeletal growth abnormalities
    - Neuromuscular diseases – muscular dystrophy and associated diseases
    - Multidisciplinary approach to orthopedic problems of cerebral palsy including muscle tone management and gait lab evaluations

    - Metabolic bone disease – rickets
    - Skeletal dysplasias such as osteogenesis imperfecta and various dwarfing conditions
    - Hand and upper extremity disorders
    - Hip disorders – dislocated hip in childhood; Legg-Calve-Perthes; slipped capital femoral epiphysis (SCFE); hip dysplasia in adolescence including a hip arthroscopy program
    - Limb deficiencies and amputations, congenital and acquired
    - Subacute trauma, post-trauma deformities and sports injuries
    - Chest wall deformities including pectus excavatum and pectus carinatum
    - Leg length discrepancies
    - Musculoskeletal tumors, benign and malignant (cooperatively with Oregon Health & Science University)
    - Motion disorders utilizing state-of-the-art Motion Analysis Lab
- common surgical approaches in pediatric orthopedics
- how to prepare patients for operative and nonoperative management and how to guide them through the recovery process of either
- current standards of care by reading Orthopedic Knowledge Update, including the edition on pediatric orthopedics.
- basic textbook information and current journal articles in pediatric orthopedics
- the key orthopedic literature in pediatric orthopedics
- the techniques and modalities used by physical therapists and how to provide appropriate guidance and coordination of care for common and complex rehabilitation guidelines
- the role of the pediatric orthopedic surgeon as part of the health care team and the relationship of the working environment with nurses, PAs, NPs, PTs, OTs, orthotists, trainers, coaches & families

Practice-Based Learning and Improvement:

- By the end of the rotation, the resident should be comfortable and confident with the following non-operative skills:
    1. Clinical assessment
    2. Upper extremity exam
    3. Lower extremity exam
    4. Basic gait analysis
    5. Evaluation and comprehension of x-rays for syndromes and neuromuscular disorders
    6. An understanding of the psychosocial issues that are relative to chronic pediatric conditions
- Participate as an assistant in surgical procedures and as primary surgeon where level of skill makes this appropriate. Develop the planning and technical skills to the level that participation as primary surgeon is appropriate on most surgical cases.
- Demonstrate ability to effectively perform preoperative planning for surgical procedures, even complex cases.
- Set up an operating room for surgery involving the spine, hip, knee, upper and lower extremities (know risks, pros and cons for each position)

- Understand and direct the role/limitations of operating personnel: scrubs, nurses, charge nurse, company representatives, schedulers and surgeons.
- Identify and clearly communicate the indication for every operation;
  Prior to scrubbing to the attending and students
- Know the algorithm for several techniques for each indication
  Be prepared in advance to complete the operation
  Understand the choices for anesthesia and indications
  Be ready to describe how to change course mid-operation
- Direct and perform with supervision the following procedures:
    1. Infection
        a. Aspiration and injection of any joint
        b. Open arthrotomy of any joints, with a focus on the hip joint
    2. Spine
        a. Posterior spine fusion and instrumentation for scoliosis
    3. Hand
        a. Trigger thumb release
        b. Ganglion cyst resection
    4. Neoplasm
        a. Resection/biopsy benign bone lesion
        b. Aspiration/injection UBC
    5. Osteotomies
        a. Pelvic (Salter, Pemberton)
        b. Proximal femoral (VDRO)
        c. Deformity correction (axial, coronal, sagittal plane)
        d. Limb lengthening
        e. Epiphysiodesis/Hemi-epiphysiodesis
    6. Feet
        a. Achilles tenotomy
        b. Tendon transfer/lengthening
        c. Coalition resection

- Plan a complete rehabilitation program for all post-operative patients
  Plan follow-up visits, PT, pain management and return to limits

Professionalism:

- Learn to organize patient clinic practice while participating in more advance patient evaluation and management activities.
- Actively and competently participate in supervising the educational and clinical activities of the junior level residents.
- Model appropriate professional values and behaviors for peers, faculty, and staff.
- Mature in the development of patient care, considering the cost, quality, outcomes, and impact on patient and healthcare system as essential variables in the equation.
- Demonstrate ability to engage in supportive, clear, and compassionate communication with patients and family members.
- Answer requests in a timely, cordial manner

Interpersonal and Communication Skills:

- The resident is expected on this rotation and all others to interact as a professional and team member with all the other staff and services within the hospital.
- The demeanor and tone of the resident in both verbal and nonverbal communication is expected to be exemplary.
- The same communication skills above are expected to be used with the patients and families.

Systems Based Practice

- Develop methods of analyzing complex data and prioritizing principles and issues to solve complex and ill-defined problems related to orthopedic patient care.
- Demonstrate appropriate judgment, particularly as related to indications for surgical treatment of patients, nonoperative treatment options and algorithm.
- Understand the daily business of medicine/orthopedic surgery
- Become facile with billing and coding issues
- Manage the patient and health system to manage a disease/injury in the context of the biopsycho-social model.

Supervisory Tasks:

Supervise surgical tech in proper use of equipment and instruments.
Supervise and direct nursing staff in patient positioning and draping technique, use and set up of arthroscopy towers and equipment

Supervise medical students during history and physical, in utilization of the electronic medical record, acquisition of radiography data.
Supervise medical assistants; in suture removal and bandaging, application of braces, application and removal of splints and casts.

Literature Resources:

Herring: Tachdjian's Pediatric Orthopaedics, 5th edition

Morrissy & Weinstein: Lovell & Winter's Pediatric Orthopaedics, 6th edition

Morrissy & Weinstein: Atlas of Pediatric Orthopaedic Surgery, 3rd edition

Wenger & Rang: The Art and Practice of Children's Orthopaedics. (Loaned to the R4 during their rotation)

Canale & Beatty: Operative Pediatric Orthopaedics, 2nd edition

Green's Operative Hand Surgery, 5th edition

Campbell's Operative Orthopaedics, 9th edition

Weinstein: Pediatric Spine: Principles and Practice, 2nd edition

Smith, Micheal & Bowker: Atlas of Amputations and Limb Deficiencies: Surgical, Prosthetic and Rehabilitation Principles, 3rd edition

Simon & Springfield: Surgery for Bone and Soft-Tissue Tumors,

Unni: Dahlin's Bone Tumors, 5th edition

Library/Electronic Resources:

Journal of Pediatric Orthopaedics

Children's Orthopaedics

Journal of Bone and Joint Surgery

Journal of the American Academy of Orthopaedic Surgeons

Clubfoot: Ponseti Management, 3rd editon. Website http://www.global-help.org/publications/books/help_cfponseti.pdf

Recommended Reading
OKU 5: Pediatrics

Ponseti: Congenital Clubfoot: Fundamentals of Treatment, 3rd edition

Journal articles of interest:

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Sutherland DH, Santi M, Abel MF. Treatment of stiff-knee gait in cerebral palsy: a comparison by gait analysis of distal rectus femoris transfer versus proximal rectus release. J Pediatr Orthop. 1990;10:433Y441.

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Gage JR, Fabian D, Hicks R, et al. Pre- and postoperative gait analysis in patients with spastic diplegia: a preliminary report. J Pediatr Orthop. 1984;4:715Y725.

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Lonstein JE, Beck K. Hip dislocation and subluxation in cerebral palsy. J Pediatr Orthop. 1986;6:521Y526.

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Beaty JH, Austin SM, Warner WC, et al. Interlocking intramedullary nailing of femoral-shaft fractures in adolescents: preliminary results and complications. J Pediatr Orthop. 1994;14:178Y183.

O'Malley DE, Mazur JM, Cummings RJ. Femoral head avascular necrosis associated with intramedullary nailing in an adolescent. J Pediatr Orthop. 1995;15:21Y23.

Reeves RB, Ballard RI, Hughes JL. Internal fixation versus traction and casting of adolescent femoral shaft fractures. J Pediatr Orthop. 1990;10:592Y595.

Langenskiold A. Surgical treatment of partial closure of the growth plate. J Pediatr Orthop. 1981;1:3Y11.

Ward WT, Levy J, Kaye A. Compression plating for child and adolescent femur fractures. J Pediatr Orthop. 1992;12:626Y632.

Heinrich SD, Drvaric DM, Darr K, et al. The operative stabilization of pediatric diaphyseal femur fractures with flexible intramedullary nails: a prospective analysis. J Pediatr Orthop. 1994;14:501Y507.

Kirby RM, Winquist RA, Hansen ST Jr. Femoral shaft fractures in adolescents: a comparison between traction plus cast treatment and closed intramedullary nailing. J Pediatr Orthop. 1981;1:193Y197.

Mizuta T, Benson WM, Foster BK, et al. Statistical analysis of the incidence of physeal injuries. J Pediatr Orthop. 1987;7:518Y523.

Jackson MA, Nelson JD. Etiology and medical management of acute suppurative bone and joint infections in pediatric patients. J Pediatr Orthop. 1982;2:313Y323.

Gamble JG, Rinsky LA. Chronic recurrent multifocal osteomyelitis: a distinct clinical entity. J Pediatr Orthop. 1986;6:579Y584.

Voto SJ, Cook AJ, Weiner DS, et al. Treatment of osteoid osteoma by computed tomography guided excision in the pediatric patient. J Pediatr Orthop. 1990;10:510Y513.

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Pueschel SM, Herndon JH, Gelch MM, et al. Symptomatic atlantoaxial subluxation in persons with Down syndrome. J Pediatr Orthop. 1984;4:682Y688.

McKay DW. New concept of and approach to clubfoot treatment: section IIIV evaluation and results. J Pediatr Orthop. 1983;3:141Y148.

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