OHSU Department of Orthopaedics and Rehabilitation

Rotation Specific Objectives for Resident Education

Rotation: Hip and Knee Reconstruction

Resident year-in-training: PGY5 & PGY3

Attending Physicians:

1. **Thomas Huff, MD**
Orthopaedic Surgeon, ABOS Board Certified, ABOS Diplomats
Fellowship: Adult Reconstruction – Hospital for Special Surgery

2. **Kathryn Schabel, MD**
Orthopaedic Surgeon, ABOS Board Certified, ABOS Diplomats
Fellowship: Adult Reconstruction – University of Utah

2. **Ryland Kagan, MD**
Orthopaedic Surgeon, ABOS Board Eligible
Fellowship: Adult Reconstruction – University of Utah

Primary Objectives:
Training in preparation for medical and surgical management of hip and knee arthritis

- Understand the varying conditions that can lead to end stage arthritis: primary osteoarthritis, inflammatory arthritis, post-traumatic conditions, or juvenile arthritic conditions as a result from disease such as SCFE or LCP.
- Understand the alternatives to joint arthroplasty including osteotomies and non-operative management.
- Understand principles of pre-operative templating for a primary hip replacement.
- Understand the proper management and treatment algorithm for an infected total joint arthroplasty.
- Understand the proper management and treatment algorithm for peri-prosthetic fractures around hip or knee arthroplasty.
- Be knowledgeable of approaches to a failed arthroplasty and comfortable with straight forward revisions.
- Have a basic knowledge of tribology and implant selection, and the advantages and disadvantages of each implant. To be able to accurately define the causes of arthroplasty failure.

Educational Philosophy
The principal goal of the adult reconstruction service is to familiarize orthopaedic residents with the management of hip and knee arthritis. This includes, first and foremost, non-surgical

management of the varying arthritic conditions. A keen understanding of which patients are surgical candidates is mandatory, along with absolute and relative contraindications to surgery. The indications for multiple treatment options should be able to be individualized to each patient; i.e. osteotomy, unicompartmental arthroplasty or hip resurfacing, total joint arthroplasty (with various degrees of constraint). Furthermore, the resident should understand varying methods of failure (infection, fracture, loosening, malposition, osteolysis, etc) and appropriate algorithms of management.

Rotation Expectations and Opportunities

The Orthopaedic Residents will work primarily with three full-time University based Adult Reconstruction surgeons. Two residents, a PGY-3 and PGY-5, will spend 10-11 weeks dedicated to Adult Reconstruction. Approximately half of the rotation will be with spent with each of the two senior faculty members (Drs. Huff and Schabel) with additional time spent with Dr. Kagan on an ad hoc basis. On average, there will be 2-3 OR days per week, 2 days of clinic per week, and ½ day of educational activity / self study (preparing for conferences, review of upcoming cases, independent study).

Huff:
Monday – OR
Tuesday – Clinic
Wednesday – OR
Thursday – clinic
Friday – OR or independent study

Schabel
Monday – OR
Tuesday – OR
Wednesday – Clinic
Thursday – Clinic
Friday – OR or independent study

Kagan
Monday – OR or clinic
Tuesday – OR or clinic
Wednesday – OR of clinic
Thursday – OR or clinic
Friday – OR or clinic

Every Tuesday, at 7am, there is a combined Joints/Tumor conference. This is a case-based conference consisting of upcoming surgical cases (primarily revisions or complicated cases), interesting cases seen in clinic, or cases of patients seen in the emergency room. This is primarily led by the PGY-3 on the joints rotation.

Residents participate as 1st assist in all circumstances, as no fellows participate. Roughly 600-800 cases annually (~65% primary arthroplasty, 25% revisions, 5% periprosthetic fractures, <5% osteotomy).

Residents are expected to prepare for each case. This includes having knowledge of the patient's history and exam specific to their hip and/or knee condition, pertinent medical information, knowledge of radiographs, and other information as pertinent. They are expected to have a preoperative template made in preparation for primary cases of hip arthroplasty, along with preoperative planning for all cases.

Residents are expected to direct and supervise learners including medical students, PA students, surgical staff and clinical staff.

Generalized Adult Hip and Knee Reconstruction Rotation Goals & Mechanisms:

Didactic

- A weekly conference on Tuesday mornings involving the adult reconstruction and tumor residents / attendings.
    - This is a case based conference consisting of upcoming surgical cases (primarily revisions or complicated cases), interesting cases seen in clinic, or cases of patients seen in the emergency room. This is primarily led by the PGY3 on the joints rotation.
- Pre-, mid- and post-rotation meetings to assess expectations and progress of residents.
- Journal Club 2-3x / year to discuss important literature on hip and knee replacements.

Patient Care

- Manage all aspects of arthritis seen in patients of all ages. This includes appropriate nonoperative treatment modalities along with varying surgical treatment options. The resident is responsible for learning and understanding indications of different procedures (PAO, HTO, UKA, TKA/THA). The resident should learn absolute and relative contraindications to total joint arthroplasty, and the risks and benefits of proceeding with surgery under various conditions.
- Attain competence in performing a comprehensive evaluation and examination of new and return patients in clinic. Comprehensive and concise history, physical examination, and diagnostic test ordering and interpretation are emphasized.
- Thorough and concise management of postoperative patients during their inpatient stay at OHSU.

Medical Knowledge

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

- Case-based learning, focusing on topically driven reading.
- Pathology behind a variety of conditions that lead to hip and/or knee arthritis: osteoarthritis, osteonecrosis, inflammatory arthritis, post-traumatic arthritis, hip dysplasia, FAI, and varying childhood disorders (LCP, SCFE, MED, PFFD).
- Medical management of hip and knee arthritis prior to surgical intervention.

- Preparation for surgical care by learning surgical approaches, implant options, and reconstruction in the setting of bone loss or fracture.
- Preparation of patients for operative and non-operative management and empathetic guidance through the recovery process of each.
- Familiarity with current standards of care by reading Orthopedic Knowledge Update, current literature, weekly case presentations, and the below listed literature resources.
- Knowledge of basic textbook information and current journal articles on orthopaedic specialties pertinent to this rotation.
- Understanding of the key orthopaedic literature on the orthopaedic specialties pertinent to this rotation.
- Understanding of the role of the Adult Reconstruction Surgeon as part of the health care team and our relationship to the working environment with; Nurses, PA's, PT's, OT's, Orthotists, Patients & Families.

Practice-Based Learning and Improvement

- 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. This includes pre-operative templating.
- Set up an operating room for surgery, including surgical instruments, implants, patient positioning, need for fluoroscopy, etc.
- 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 as indicated.
- 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, if needed
    - Direct and perform the following procedures:
        1. Aspiration and Injection of the Knee joint; injection of Trochanteric bursa
        2. Primary Hip and Knee Arthroplasty
        3. Revision Hip and Knee Arthroplasty
            a. Infection – first and second stage revision
            b. Osteolysis
            c. Implant failure
            d. Instability
            e. Need for constraint
        4. ORIF in the setting of periprosthetic fracture

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 (for PGY-5s) or medical students (for PGY-3s and PGY-5s).
- 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 orthopaedic patient care.
- Demonstrate appropriate judgment, particularly as related to indications for surgical treatment of patients, non-operative treatment options and algorithms.
- 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 biopsychosocial model.

Literature Resources:

Textbooks

Orthopaedic Knowledge Update: Hip and Knee Reconstruction 5

The Adult Hip, Callaghan & Rosenberg (2 Volumes) - in Orthopaedic library

Insall & Scott Surgery of The Knee (4 Volumes) - in Orthopaedic library

Articles

Hip Arthroplasty

Leg-Length Discrepancy

Clark CR, Huddleston JD, Schoch EP III, Thomas BJ. Leg-length Discrepancy After Total Hip Arthroplasty. *JAAOS*. 2006, 14, 38-45.

Jasty M, Webster W, Harris W. Management of Limb Length Inequality During Total Hip Replacement. *CORR*. 1996, 333, 165-71.

Maloney WJ, Keeney JA. Leg Length Discrepancy After THA. *J Arthroplasty*. 2004, 19, 108-10.

Ranawat CS, Rodriguez JA. Functional Leg-length inequality Following Total Hip Arthroplasty. *J Arthroplasty*. 1997, 12, 359-64.

Nerve Injuries s/p THA

Edwards BN, Tulles JS, Noble PC. Contributory Factors and Etiology of Sciatic Nerve Palsy in THA. *CORR*. 1987, 218, 136-41.

Dehart NM, Riley LH Jr. Nerve Injuries in THA. *JAAOS*. 1999, 7, 101-11.

Heterotopic Ossification

Padgett DE, Holley KG, Cummings M, et al. The efficacy of 500 centigray radiation in the prevention of heterotopic ossification after THA: A prospective, randomized, pilot study. *J Arthroplasty*. 2003, 18, 677-86.

Rama KRBS, Vendittoli PA, Ganapathi M, et al. Heterotopic Ossification after Surface Replacement Arthroplasty and THA: A Randomized Study. *J Arthroplasty*. 2009, 24, 256-62.

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Femoral Neck Fracture

Chammout GK, Mukka SS, Carlsson T, et al. Total Hip Replacement versus Open Reduction Internal Fixation of Displaced Femoral Neck Fractures: A Randomized Long Term Follow-Up Study. *JBJS-A*. 2012, 94A, 1921-28.

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Parker MI, Pryor G, Gurusamy K. Cemented vs Uncemented hemiarthroplasty for intracapsular hip fractures: a randomised controlled trial in 400 patients. *JBJS-B*. 2010, 92B, 116-22.

Raia FJ, Chapman CB, Herrera MF, et al. Unipolar or Bipolar Hemiarthroplasty for Femoral Neck Fractures in the Elderly. *CORR*. 2003, 414, 259-65.

Zi-Sheng A, You-Shui G, Zhi-Zhen J, et al. Hemiarthroplasty vs Primary Total Hip Arthroplasty for Displaced Fractures of the Femoral Neck in the Elderly: A Meta-Analysis. *J Arthroplasty*. 2012, 27, 573-590.

Osteonecrosis

Hungerford MW, Mont MM, Scott R, et al. Surface Replacement Hemiarthroplasty for the Treatment of Osteonecrosis of the Femoral Head. *JBJS-A*. 1998, 80A, 1656-64.

Lai KA, Shen WJ, Yang CY, et al. The Use of Alendronate To Prevent Early Collapse of the Femoral Head in Patients with Nontraumatic Osteonecrosis: A Randomized Clinical Study. *JBJS-A*. 2005, 87A, 2155-59.

Lavernia CJ, Sierra RJ, Grieco FR. Osteonecrosis of the Femoral Head. *JAAOS*. 1999, 7, 250-61.

Mont M, Hungerford DS. Non-Traumatic Avascular Necrosis of the Femoral Head: Current Concepts Review. *JBJS-A*. 1995, 77A, 459-474.

Mont MA, Jones LC, Hungerford DS. Nontraumatic Osteonecrosis of the Femoral Head: Ten Years Later - Current Concepts Review. *JBJS-A*. 2006, 88A, 1117-32.

Osteolysis

Bragdon CR, Jasty M, Muratoglu OK, et al. Third Body Wear Testing of a Highly Cross-Linked Acetabular Liner: The Effect of Large Femoral Head Size in the Presence of Particulate Poly (methyl-methacylate) Debris. *J Arthroplasty*. 2003, 20, 379-85.

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Orishimo KF, Claus AM, Sychterz CJ, et al. Relationship Between Polyethylene Wear and Osteolysis in Hips with a Second-Generation Porous-Coated Cementless Cup After Seven Years of Follow-Up. *JBJS-A*. 85A, 1095-1099.

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Stulberg D, Wixson RL, Adams AD, et al. Monitoring Pelvic Osteolysis Following Total Hip Replacement Surgery: An Algorithm for Surveillance. *JBJS-A*. 2002, 84A, 116-122.

Dislocation / Instability

Alberton GM, High WA, Morrey BF. Dislocation after revision total hip arthroplasty: analysis of risk factors and treatment options. *JBJS-A*. 2002, 84, 1788-92.

Beaule PE, Schmalzried TP, Udomkiat P, et al. Jumbo Femoral Head for the Treatment of Recurrent Dislocation Following Total Hip Replacement. *JBJS-A*. 2002, 84A, 256-63.

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Constrained Acetabular Liner

Berned KR, Lombardi AV Jr, Mallory TH, et al. The Long-term Outcomes of 755 Consecutive Constrained Acetabular Components in Total Hip Arthroplasty: Examining the Successes and Failures. *J Arthroplasty*. 2005, 20, 93-101.

Della Valle CJ, Chang D, Sporer S, et al. High Failure Rate of a Constrained Acetabular Liner in Revision Total Hip Arthroplasty. *J Arthroplasty*. 2005, 20, 103-107.

Goetz DD, Capello WN, Callaghan JJ, et al. Salvage of a recurrently dislocating total hip prosthesis with use of a constrained acetabular component: a retrospective analysis of fifty-six cases. *JBJS-A*. 1998, 80, 502-9.

Sharder WM, Parvizi J, Lewallen DG. The use of a Constrained Acetabular Component to Treat Instability After THA. *JBJS-A*. 2003, 85A, 2179-2183.

Revision THA

Beaule PE, LeDuff MJ, Dorey FJ. Fate of Cementless Acetabular Components Retained During Revision THA. *JBJS-A*. 2003, 85A, 2288-2292.

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Trochanteric Osteotomy

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Metal-Metal THA

Antoniou J, Zukor DJ, Mwale F, et al. Metal Ion Levels in the Blood of Patients After hip resurfacing: A comparison between 28 and 36 millimeter-head Metal-on-Metal Prostheses. *JBJS-A*. 2008, 90A, 142-48.

Chan FW, Bobyn JD, Medley JB, et al. Wear and Lubrication of Metal-on-Metal Hip Implants. *CORR*. 1999, 369, 10-24.

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Sabbath SA, Mitchell AWB, Henckel J, et al. Magnetic Resonance Imaging Findings in Painful Metal-on-Metal Hips: A Prospective Study. *J Arthroplasty*. 2011, 26, 71-6.

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Amanatullah DF, Landa J, Strauss EJ, et al. Comparison of Surgical Outcomes and Implant Wear Between Ceramic-Ceramic and Ceramic-Polyethylene Articulations in THA. *J Arthroplasty*. 2011, 26, 72-77.

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Total Knee Arthroplasty

Cemented All PE Tibial Component

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Mobile Bearing TKA

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Cruciate Retaining vs Stabilized TKA

Maruyama S, Yoshiya S, Matsui N, et al. Functional Compaison of Posterior Cruciate Retaining versus Posterior Stabilized TKA. *J Arthroplasty*. 2004, 19, 349-53.

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UKA

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High Tibial Osteotomy

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