



Department of Orthopaedics and Rehabilitation

Rotation-Specific Objectives for Resident Education	
Rotation:	Trauma
Resident Year-In-Training:	PGY1, PGY2, PGY5

Attending Physicians

1. Darin Friess, M.D.

Orthopedic Surgeon, ABOS Board Certified
Fellowship: Trauma

2. Adam Mirarchi, M.D.

Orthopaedic Surgeon, ABOS Board Certified
Fellowship: Hand & Upper Extremity Surgery
Certificate of Added Qualification (CAQ) Hand

3. James Meeker, M.D.

Orthopaedic Surgeon, ABOS Board Eligible
Fellowship: Foot and Ankle Surgery, Trauma

Primary Objective

Surgical and medical training related to orthopedic trauma. This is to include, but not be limited to, the initial work-up and triage of patients with acute injuries from trauma and post trauma sequelae. At the end of the rotation, the trainee will be able to conduct a history and physical in the initial evaluation of urgent orthopaedic trauma and manage these patients on the ward in the peri-operative period. In addition, the trainee will understand post trauma and post operative sequelae including nonunion and malunion of fractures.

Educational Philosophy

The principal goal of the orthopaedic trauma service at OHSU is to familiarize orthopaedic residents with the management of orthopaedic injuries from acute trauma. Most often this trauma is secondary to motor vehicle crashes and gunshot wounds. An understanding of which injuries need surgical management and an understanding of appropriate nonoperative management of other injuries is mandatory. Furthermore, the resident should understand varying methods of failure (infection, nonunion, malunion, loosening, etc) and appropriate algorithms of management.

Rotation Expectations and Opportunities

The Orthopaedic Residents will work primarily with a Traumatologist. They will also spend time with an upper extremity surgeon and a foot and ankle surgeon. The PGY1 is primarily responsible for ED and floor consults from 6:30am to 6pm, going to the OR if time allows. One PGY2 is on night float, Sunday night through Thursday night 6pm-6:30am. The other PGY2 and the PGY5 will be primarily in the OR or in clinic. On average, there will be 3-4 OR days per week, 1 day of clinic per week, and ½ day of educational activity / self study (preparing for conferences, review of upcoming cases, independent study).

PGY2 and PGY5

Monday: OR with Dr. Friess

Tuesday: OR with Dr. Friess

Wednesday: OR with Dr. Mirarchi

Thursday: OR with Dr. Friess

Friday: Clinic with Dr. Friess or OR with Dr. Meeker

Every morning at 6am, there is a fracture rounds conference. The consults from the day before are presented followed by a discussion of appropriate treatment plan. Furthermore, there is a weekly topic conference at 7am on Thursdays. This conference focuses on diagnosis and treatment plans of common fracture patterns which are also listed in the section regarding medical knowledge.

Generalized Rotation Goals & Mechanisms

Didactic

- A weekly conference on Thursday mornings involving the residents / attendings.
- Pre-, mid- and post-rotation meetings to assess expectations and progress of residents.
- Journal Club 2-3x / year to discuss important literature on trauma. This journal club is combined with the Legacy Emanuel orthopaedic trauma group.

Patient Care

- Manage all aspects of acute trauma seen in patients of all ages. This includes appropriate non-operative treatment modalities along with varying surgical treatment options. The resident is responsible for learning and understanding indications of operative fixation for fractures.
- Attain competence in performing a comprehensive evaluation and examination of new patients seen through the ED. Comprehensive and concise history, physical examination, and diagnostic test ordering and interpretation are emphasized.
- Thorough and concise management of post-operative patients during their inpatient stay.

Medical Knowledge

- For each location discussed (list below), the resident should understand the relevant fracture pattern, mechanism of injury, anatomy, and appropriate history and physical exam. Discussion from staff will focus on a case - based learning approach as patients

are treated. Questions and answers will most often be covered by simple review textbooks supplemented by the reading list below.

- Clavicle
 - Proximal humerus
 - Humeral shaft
 - Distal humerus
 - Fractures about the elbow (terrible triad, radial head, olecranon)
 - Forearm shaft
 - Distal radius
 - Scaphoid, carpal instability, phalangeal, metacarpal
 - Pelvic ring
 - Acetabulum
 - Proximal femur
 - Femoral shaft
 - Distal femur
 - Tibial plateau
 - Tibial shaft
 - Distal tibia/pilon
 - Ankle
 - Calcaneus, talus
 - Lisfranc, Metatarsal
- For each location discussed, the resident will list the relevant radiographic classification scheme for the fracture.

Practice-Based Learning and Improvement

- By the end of the rotation, each PGY1, PGY2 and PGY5 resident should be comfortable and confident with the following non-operative skills:
 1. clinical assessment
 2. Upper Extremity Exam
 3. Lower Extremity Exam
 4. Evaluation and comprehension of x-rays for each fracture pattern
 5. An understanding of the psychosocial issues that are relative to trauma
 6. Basic procedures performed in the ED with direct supervision:
 - closed reductions of fractures and dislocations: distal radius, ankle, shoulder and elbow dislocations
 - arthrograms and injections of knee, ankle, wrist, elbow, shoulder
 - traction pin placement in femur and tibia
 7. In addition, the PGY2 resident should be comfortable without direct supervision performing the procedures listed above. They should also be familiar with closed reductions of hip dislocations and fracture-dislocations
 8. In addition, the PGY5 resident should be comfortable with evaluation and comprehension of CT and MRI for each fracture pattern. The PGY5 resident should also be comfortable in the counseling of nonoperative management of various fracture patterns.

- 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, 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 at the PGY2 level:
 1. safe positioning of the patient in surgery
 2. identification and initial management of postoperative complications
 3. approach and fixation of basic fracture patterns including hip, ankle, and long bone shaft, and distal radius.
 4. Placement of external fixation
- Direct and perform the following procedures at the PGY5 level (in addition to those listed above):
 5. analysis and management of postoperative complications
 6. approach and fixation of periarticular fractures
 7. approach to acetabulum and pelvic ring

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 PGY5s) or medical students (for PGY3s and 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

Pelvic ring injury

Pennal GF, Tile M, Waddell JP, Garside H. Pelvic disruption: assessment and classification. Clin Orthop 1980;151:12-21

Tile M. Pelvic ring fractures: Should they be fixed? J Bone Joint Surg 1988;70B:1-12.

Burgess, AR, et al. Pelvic ring disruptions: Effective classification system and treatment protocols J. Trauma 1990;30:848-856.

Denis F, Davis S, Comfort T. Sacral fractures: an important problem. Retrospective analysis of 236 cases. Clin Orthop 1988;227:67-81.

Latenser BA, et al. Improved outcome with early fixation of skeletally unstable pelvic fractures. J Trauma 1991;31:28-31.

Roult ML Jr, Simonian PT, Ballmer F. A rational approach to pelvic trauma. Resuscitation and early definitive stabilization. Clin Orthop 1995;318:61-74.

Roult ML Jr, Kregor PJ, Simonian PT, Mayo K. Early results of percutaneous iliosacral screws placed with the patient in the supine position. J Orthop Trauma 1995;9:207-214.

Dujardin FH, et al. Long-term functional prognosis of posterior injuries in high-energy pelvic disruption. J Orthop Trauma 1998;12:145-151.

Acetabular fracture

Judet R, Judet J, Letournel E. Fractures of the acetabulum. Classification and surgical approaches for open reduction. J Bone Joint Surg 1964;46A:1616-1646.

Brumback RJ, et al. Acetabular depression fractures accompanying posterior fracture dislocation of the hip. J Orthop Trauma 1990;4:42-48.

Olson SA, Matta JM. The computerized tomography subchondral arc: a new method of assessing acetabular articular incongruity after fracture (a preliminary report). *J Orthop Trauma* 1993;7:402-413.

Letournel E. The treatment of acetabular fractures through the ilioinguinal approach. *Clin Orthop* 1993;292:62-76.

Matta JM. Fractures of the acetabulum: accuracy of reduction and clinical results in patients managed operatively within three weeks after the injury. *J Bone Joint Surg* 1996;78A:1632-1645.

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Hip dislocation

Thomas VP, Epstein HC. Traumatic dislocation of the hip: A survey of two hundred and four cases covering a period of twenty-one years. *J Bone Joint Surg* 1951;33A:746-778.

Stuart JM, Milford LW. Fracture-dislocation of the hip: An end result study. *J Bone Joint Surg* 1954;36A:315-342.

Trueta J, Harrison MHM. The normal vascular anatomy of the femoral head in adult man. *J Bone Joint Surg* 1953;35B:442-461.

Yue JJ, Wilber JH, Lipuma JP, et al. Posterior hip dislocations: a cadaveric angiographic study. *J Orthop Trauma* 1996;10:447-454.

Femoral head fracture

Pipkin G. Treatment of grade IV fracture-dislocation of the hip: A review. *J Bone Joint Surg* 1957;39A:1027-1042.

Swiontkowski MF, Thorpe M, Seiler JG, et al. Operative management of displaced femoral head fractures: Case-matched comparison of anterior versus posterior approaches for Pipkin I and Pipkin II fractures. *J Orthop Trauma* 1992;6:437-442.

Hip fracture-low energy

Garden RS. Low-angle fixation in fractures of the femoral neck. *J Bone Joint Surg* 1961;43B:647-663.

Parker MJ, Khan RJK, Crawford J, et al. Hemiarthroplasty versus internal fixation for displaced intracapsular hip fractures in the elderly. *J Bone Joint Surg* 2002;84B:1150-1155.

Calder SJ, Anderson GH, Jagger C, et al. Unipolar or bipolar prosthesis for displaced intracapsular hip fractures in octogenarians: A randomized prospective study. *J Bone Joint Surg* 1996;78B:391-394.

Baumgaertner MR, Curtin SL, Lindskog DM. The value of the tip-apex distance in predicting failure of fixation of peritrochanteric fractures of the hip. *J Bone Joint Surg* 1995;77A:1058-1064.

Adams CJ, Robinson CM, Court-Brown CM, McQueen MM. Prospective randomized controlled trial of an intramedullary nail versus dynamic screw and side plate for intertrochanteric fractures of the femur. *J Orthop Trauma* 2001;15:394-400.

Aharonoff GB, Koval KJ, Skovron ML, et al. Hip fractures in the elderly: Predictors of one year mortality. *J Orthop Trauma* 1997;11:162-165.

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Hip fracture-high energy

Swiontkowski MF, Winkquist RA, Hansen ST Jr. Fractures of the femoral neck in patients between the ages of twelve and forty-nine years. *J Bone Joint Surg* 1984;66A:837-846.

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Femoral neck fracture biomechanics

Blair B, Koval KJ, Kummer F, et al. Basicervical fractures of the proximal femur. A biomechanical study of 3 fixation techniques. *Clin Orthop* 1994;306:256-263.

Stankewich CJ, Chapman J, Muthusamy R, et al. Relationship of mechanical factors to the strength of proximal femur fractures fixed with cancellous screws. *J Orthop Trauma* 1996;10:248-257.

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Femur fracture

Winkquist RA, Hansen ST Jr, Clawson DK. Closed intramedullary nailing of femoral fractures: A report of five hundred and twenty cases. *J Bone Joint Surg* 1984;66A:529-539.

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Distal femur fracture

Bolhofner BR, Carmen B, Clifford P. The results of open reduction and internal fixation of distal femur fractures using a biologic (indirect) reduction technique. *J Orthop Trauma* 1996;10:372-377.

Krettek C, Schandelmaier P, Miclau T, et al. Minimally invasive percutaneous plate osteosynthesis (MIPPO) using the DCS in proximal and distal femoral fractures. *Injury* 1997;28 Suppl 1:A20-30.

Patella fracture

Smith ST, Cramer KE, Karges DE, et al. Early complications in the operative treatment of patellar fractures. *J Orthop Trauma* 1997;11:183-187.

Carpenter JE, Kasman RA, Patel N, Lee MA, Goldstein SA. Biomechanical evaluation of current patellar fracture fixation techniques. *J Orthop Trauma* 1997;11:351-356.

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Tibial shaft fracture

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Limb salvage

Lange RH, Bach AW, Hansen ST Jr. Open tibial fractures with associated vascular injury: prognosis for limb salvage. *J Trauma* 1985;25:203-208.

Johansen K, Daines M, Howey T, et al. Objective criteria accurately predict amputation following lower extremity trauma. *J Trauma* 1990;30:568-572.

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Tibial plafond fracture

Ruedi T. Fractures of the lower end of the tibia into the ankle joint: results 9 years after open reduction and internal fixation. *Injury* 1973;5:130-137.

Teeny SM and Wiss DA. Open reduction and internal fixation of tibial plafond fractures. Variables contributing to poor results and complications. *Clin Orthop* 1993;292:108-117.

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Sirkin M, Sanders R, DiPasquale T, et al. A staged protocol for soft tissue management in the treatment of complex pilon fractures. *J Orthop Trauma* 1999;13:78-84.

Ankle fracture

Pettrone FA, Gail M, Pee D, et al. Quantitative criteria for the prediction of the results after displaced fracture of the ankle. *J Bone Joint Surg* 1983;65A:667-677.

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Canale ST, Kelly FB Jr. Fractures of the neck of the talus: Long-term evaluation of seventy-one cases. *J Bone Joint Surg* 1978;60A:143-156.

Lisfranc fracture

Kuo RS, Tejwani NC, DiGiovanni CW, et al. Outcome after open reduction and internal fixation of Lisfranc joint injuries. *J Bone Joint Surg* 2000;82A:1609-1618.

Richter, et al. Fractures and fracture-dislocations of the midfoot, occurrence, causes, long-term results. *Foot Ankle Int* 2001;22:392-398.

Calcaneus fracture

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Distal humerus fracture

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