

Orthopaedic Trauma Service

1. Rotation Goals and Objectives by Core Competency

General Goals & Objectives PGY-1 Year

A. Patient Care

- 1) Learn the essentials concerning performing a history and physical examination
- 2) Learn the principles of interpreting a plain radiograph (be able to recognize a fracture)
- 3) Recognize the historical symptoms of trauma patients.
- 4) Know the evaluation strategy for the patient with traumatic injury.
- 5) Demonstrate common non-operative skills
 - a. Splint application
 - b. Cast application
 - c. Joint aspiration/injection
 - d. Fracture manipulation
 - e. Joint reduction
- 6) Demonstrate basic operating room skills:
 - a. Patient positioning
 - b. Preparation and draping of the patient
 - c. Assisting with retractors, lights, and maintaining a blood free field
 - d. Learn layered closure
 - e. Placement of suction drains
- 7) Demonstrate the ability to care for patients postoperatively:
 - a. Wound care
 - b. Antibiotic prophylaxis
 - c. Anticoagulation management
 - d. Pain management
 - 8) Consistently mark patients with initials prior to surgery and drape the initials into the surgical field.
- 9) Consistently perform the surgical time out prior to incision
- 10) Report medical errors to the attending surgeon when recognized
- 11) Organize and supervise medical students.
- 12) Develop patient management plan for patients admitted directly to the hospital

B. Interpersonal and Communication Skills

- 1) Listen to patients' concerns and express sensitivity and empathy for their injuries, personal losses, and basic medical problems
- 2) Explain the risks and goals of surgery to patients and their families and alternatives to surgery (perform informed consent for simple procedures)
- 3) Establish an effective patient-doctor relationship – attire, grooming, manner of speech, concern, and commitment
- 4) Establish an appropriate level of communication and relationship with ancillary staff:
 - a. Refrain from abusive behavior
 - b. Be courteous
 - c. Report staff who are disrespectful and do their duties in a less than satisfactory manner (patient safety net)
- 5) Be able to use legible handwriting and print one's name under all signatures (or use the stamp)
- 6) Date and time all notes
- 7) Dictate discharge summaries on the day of surgery
- 8) Answer patient telephone calls on the same day that they are received

C. Professionalism

- 1) Be sensitive and responsive to differences in culture, gender, age, and impairments of both patients and staff
- 2) Be sensitive to the needs of trauma patients in terms of emotional support
- 3) Be reliable in the performance of responsibilities
- 4) Respect the opinions of other healthcare professionals
- 5) Express opinions in a manner that is sensitive to others

D. Medical Knowledge

- 1) Working knowledge of the common orthopaedic emergencies
 - a. Compartment syndrome
 - b. Cauda equina syndrome
 - c. Fat embolism syndrome
 - d. Pulmonary embolism
 - e. Deep venous thrombosis

- 3) Basic working knowledge of simple common fractures
 - a. Clavicle
 - b. Distal radius
 - c. Ankle
 - d. Hip

E. Practice Based Learning and Improvement

- 1) Analyze the effectiveness of his or her own interpretative, problem solving, and surgical skills
- 2) Use available information technology to obtain and manage information
- 3) Be receptive to constructive criticism

F. Systems-Based Practice

- 1) Demonstrate ability to provide cost effective care:
 - a. Utilization of appropriate diagnostic tests
 - b. Appropriate use of antibiotics
- 2) Utilize the health care system to provide optimal patient care outside the hospital system
- 3) Utilize the chain of command in both the supervision of subordinates and the interaction with seniors
- 4) Recognize emergencies and communicate the problem to appropriate personnel

General Goals & Objectives PGY-2 Year

A. Patient Care

- 1) Complete the history and physical examination form, interpret imaging studies, and formulate a differential diagnosis of a patient with high and low energy trauma.
- 2) Recognize the historical relevant history indicating high energy trauma.
- 3) Identify patients with common orthopaedic emergencies: open fracture, compartment syndrome, and infection.
- 4) Know the appropriate radiographic evaluation for patients with fractures.
- 5) Select appropriate adjunctive studies for common trauma conditions.
- 6) Be able to choose reasonable options for the fixation of common fracture patterns, including ankle, distal radius, hip, femur, and tibia fractures.
- 7) Demonstrate proficiency in formulating a preoperative plan for fracture surgery.

- 8) Demonstrate technical competence in the operating room:
 - a. Perform intramedullary nailing independently
 - b. Perform bipolar hemi-arthroplasty independently
 - c. Demonstrate basic proficiency in the dissection of nerves and blood vessels
- 9) Demonstrate the ability to care for patients postoperatively:
 - a. Wound care
 - b. Antibiotic prophylaxis
 - c. Anticoagulation management
 - d. Pain management
- 10) Consistently mark patients with initials prior to surgery and drape the initials into the surgical field.
- 11) Consistently perform the surgical time out prior to incision
- 12) Report medical errors to the attending surgeon when recognized
- 13) Organize and supervise the interns, junior and senior residents, and paramedical staff in the daily care of the service patients.
- 14) Develop patient management plan for patients admitted directly to the hospital

B. Interpersonal and Communication Skills

- 1) Listen to patients' concerns and express sensitivity and empathy for their medical problems
- 2) Explain the risks and goals of surgery to patients and their families and alternatives to surgery (perform informed consent)
- 3) Establish an effective patient-doctor relationship – attire, grooming, manner of speech, concern, and commitment
- 4) Establish an appropriate level of communication and relationship with ancillary staff:
 - a. Refrain from abusive behavior
 - b. Be courteous
 - c. Report staff who are disrespectful and do their duties in a less than satisfactory manner
- 5) Use legible handwriting and print one's name under all signatures
- 6) Date and time all notes
- 7) Dictate operative notes on the day of surgery
- 8) Dictate discharge summaries on the day of surgery
- 9) Answer patient telephone calls on the same day that they are received

C. Professionalism

- 1) Be sensitive and responsive to differences in culture, gender, age, and impairments of both patients and staff
- 2) Be sensitive to the needs of trauma patients in terms of emotional support
- 3) Be reliable in the performance of responsibilities
- 4) Respect the opinions of other healthcare professionals
- 5) Express opinions in a manner that is sensitive to others

D. Medical Knowledge

- 1) Demonstrate working knowledge of the presentation history, clinical presentation, and radiographic findings of common fracture patterns
- 2) Answer the sample written trauma questions
- 3) Identify specific patterns of classification for common fracture patterns and their clinical relevance
- 4) Apply knowledge base in the care of patients

5) Practice Based Learning and Improvement

- 1) Analyze the effectiveness of his or her own interpretative, problem solving, and surgical skills
- 2) Use available information technology to obtain and manage information
- 3) Be receptive to constructive criticism

6) Systems-Based Practice

1. Demonstrate ability to provide cost effective care:
 - a. Utilization of appropriate diagnostic tests
 - b. Appropriate use of antibiotics
 - c. Economical selection of implants for fracture care
2. Utilize the health care system to provide optimal patient care outside the hospital system
3. Fully utilize the chain of command in both the supervision of subordinates and the interaction with seniors
4. Recognize emergencies and communicate the problem to appropriate personnel

General Goals & Objectives PGY-5 Year

A. Patient Care

- 1) Complete the history and physical examination form, interpret imaging studies, and formulate a differential diagnosis of a patient with trauma to the musculoskeletal system
- 2) Recognize the historical symptoms and signs of trauma orthopaedic emergencies
- 3) Know the evaluation strategy for the patients with single and multiple long bone trauma
- 4) Be able to choose reasonable options for the treatment of long bone and peri-articular fractures of the upper and lower extremity:
 - a. Displaced ankle fractures
 - b. Displaced tibia fractures
 - c. Tibial plateau fractures
 - d. Femoral shaft fractures
 - e. Intertrochanteric fractures
 - f. femoral neck fractures
- 5) Demonstrate technical competence in the operating room:
 - a. Perform intramedullary nailing independently (under supervision)
 - b. Perform bipolar hemi-arthroplasty independently (under supervision)
 - c. Perform open reduction internal fixation of ankle fractures independently (under supervision)
 - d. Perform open reduction and internal fixation of distal radius fractures with minimal supervision (under supervision)
 - e. Perform external fixation of long bone fractures independently (under supervision)
 - f. Perform open reduction internal fixation of femoral neck and intertrochanteric hip fractures independently (under supervision)
- 6) Demonstrate the ability to care for patients postoperatively:
 - a. Wound care
 - b. Antibiotic prophylaxis
 - c. Anticoagulation management
 - d. Pain management
- 7) Consistently mark patients with initials prior to surgery and drape the initials into the surgical field.
- 8) Consistently perform the surgical time out prior to incision

- 9) Report medical errors to the attending surgeon when recognized
- 10) Organize and supervise the interns, junior and senior residents, and paramedical staff in the daily care of the service patients.
- 11) Develop patient management plan for patients admitted directly to the hospital

B. Interpersonal and Communication Skills

- 1) Listen to patients' concerns and express sensitivity and empathy for their medical problems
- 2) Explain the risks and goals of surgery to patients and their families and alternatives to surgery (perform informed consent)
- 3) Establish an effective patient-doctor relationship – attire, grooming, manner of speech, concern, and commitment
- 4) Establish an appropriate level of communication and relationship with ancillary staff:
 - a. Refrain from abusive behavior
 - b. Be courteous
 - c. Report staff who are disrespectful and do their duties in a less than satisfactory manner (utilize patient safety net)
- 5) Use legible handwriting and print one's name under all signatures (or use stamp)
- 6) Date and time all notes
- 7) Dictate operative notes on the day of surgery
- 8) Dictate discharge summaries on the day of surgery
- 9) Answer patient telephone calls on the same day that they are received

C. Professionalism

- 1) Be sensitive and responsive to differences in culture, gender, age, and impairments of both patients and staff
- 2) Be sensitive to the needs of cancer patients in terms of emotional support
- 3) Be reliable in the performance of responsibilities
- 4) Respect the opinions of other healthcare professionals
- 5) Express opinions in a manner that is sensitive to others

D. Medical Knowledge

- 1) Working knowledge of the classification of common fractures
- 2) Working knowledge of the classification of open fractures
- 3) Working knowledge of the principles of intramedullary nailing
- 4) Working knowledge of the principles of plate fixation
- 5) Working knowledge of results of fracture treatment

E. Practice Based Learning and Improvement

- 1) Analyze the effectiveness of his or her own interpretative, problem solving, and surgical skills
- 2) Use available information technology to obtain and manage information
- 3) Be receptive to constructive criticism

F. Systems-Based Practice

- 1) Demonstrate ability to provide cost effective care:
 - a. Utilization of appropriate diagnostic tests
 - b. Appropriate use of antibiotics
- 2) Utilize of the health care system to provide optimal patient care outside the hospital system
- 3) Fully utilize the chain of command in both the supervision of subordinates and the interaction with seniors
- 4) Recognize emergencies and communicate the problem to appropriate personnel:
 - a. Compartment syndrome
 - b. Cauda equina syndrome
 - c. Acute infections
 - d. Chronic infections
 - e. Fat embolism syndrome
 - f. Pulmonary embolus

2. Resident Supervision (Trauma Service)

The resident is part of the trauma surgery team, providing care of patients in the emergency department, the clinic, the hospital, and the operating room. The resident acts under the direct supervision of the trauma surgery staff at all times. All patients evaluated by the resident will be discussed with and examined by the attending surgeon as well. The resident's daily activities are

managed by the faculty – Greg Osgood, M.D.. This provides the opportunity for immediate feedback.

Surgical procedures are performed under the direct supervision of an attending physician at all times, including nights, weekends, and holidays. The surgical attending determines when a resident should and has achieved independence in procedures, and in supervising other residents and students.

The resident reports directly to the attending surgeon. The attending surgeon, at a minimum, is immediately available by telephone or pager or, when on call, within 30 minutes by request on site.

For inpatient and emergency department consults, the attending “on call” that day should be contacted and will be responsible for treatment plan and staffing any immediate operative intervention. The trauma faculty will coordinate inpatient follow-on care for those patients requiring admission and outpatient care for those discharged from the emergency department. For questions regarding inpatients or patients in PACU, the attending surgeon who performed that patient’s surgery should be contacted. For any trauma emergencies (outside of the emergency department) when Greg Osgood is not on call, contact Greg Osgood, M.D. during day hours and the orthopaedic on call faculty after 8PM. If no one is available, contact Greg Osgood, M.D.

Contact information:

Laronda Johnson 410-955-1796

Greg Osgood, M.D.

410-493-4867 (cell)

410-283-3209 (pager)

410-363-2289 (home)

3. Clinical Activities

Patient Rounds

Daily pre-rounds are performed by the adult service resident team. Urgent patient calls are addressed by the intern for the service or the on-call resident.

The team conducts supervised patient rounds with a faculty member daily. The medical history and current physical examination are discussed for each patient. A history and physical examination is performed by the faculty member. Relevant examination techniques are discussed fully. The team plan is discussed at length and documented by the faculty member. Interventions are performed during and after rounds, based on the faculty member’s plan. The care plan is coordinated with the adult service and trauma nurse practitioners.

New inpatient consultations and new inpatient visits are staffed by a faculty member during daily patient rounds.

Mon, Wed, Fri: Greg Osgood, M.D.

Tues: Kristy Weber, M.D.

Thurs: Edward McFarland, M.D.

Surgical Care

The orthopaedic trauma service has a trauma operating room 4 days per week: Monday, Tuesday, Thursday, and Friday. Scheduling operative cases on Wednesday is possible on an add-on basis only in available unscheduled operating time or after regular elective operating hours. Scheduling

elective and emergency operative cases is performed by the resident team and Dr. Greg Osgood's office coordinator Laronda Johnson, in close coordination with Greg Osgood, M.D..

Operations are performed by the residents on the orthopaedic trauma service with direct supervision by Greg Osgood, M.D. or other assisting faculty. A team approach is taken to performing surgical procedures in which all residents participate in components of the procedure. Residents will only perform elements of the surgical procedure that they are capable of performing, as determined by the faculty member.

Pre-operative and post-operative interdisciplinary patient care coordination responsibilities are shared between the residents and the trauma faculty. Pre-operative clearance and the medical optimization of patients prior to surgery are the shared responsibilities of residents and faculty of the medicine, surgery, and orthopaedic trauma services. The day-to-day coordination of this care is discussed on rounds daily and as needed.

Office Hours / Clinic

Two orthopaedic trauma clinics are conducted weekly. Wednesday is a full-day clinic that is supervised by Greg Osgood, M.D. Thursday afternoon clinic is conducted by the orthopaedic trauma nurse practitioner or another orthopaedic surgery faculty member. Both are attended by available orthopaedic trauma team residents.

Patients are first evaluated and examined by residents. Every patient is presented formally to the supervising attending or nurse practitioner. A history and physical examination is performed by the faculty member. Relevant examination techniques are discussed fully. The plan is discussed at length and documented by the faculty member.

Pre-operative paperwork and coordination of pre-operative evaluation is conducted by residents, nurses, and faculty during clinic, in addition to after-hours.

Additional Patient Care

Residents assist in the daily phone call requests of patients to answer clinical questions, assist in scheduling surgery, and write prescriptions.

4. Required Readings

Week 1- Ballistic Fractures

Management of the Polytrauma Patient

Chapter 49 – Gunshot Wounds and Open Fractures

Chapter 50 – Evaluation of the Trauma Patient

Circumferential pelvic antishock sheeting: a temporary resuscitation aid.

Routt ML Jr, Falicov A, Woodhouse E, Schildhauer TA.
J Orthop Trauma. 2002 Jan;16(1):45-8.

Detection of traumatic arthrotomy of the knee using the saline solution load test.

Nord RM, Quach T, Walsh M, Pereira D, Tejwani NC.
J Bone Joint Surg Am. 2009 Jan;91(1):66-70.

Week 2- Pelvic Fractures

Chapter 53 Pelvic, Acetabular, and Sacral Fractures

Pelvic fracture in multiple trauma: classification by mechanism is key to pattern of organ injury, resuscitative requirements, and outcome.

Dalal SA, Burgess AR, Siegel JH, Young JW, Brumback RJ, Poka A, Dunham CM, Gens D, Bathon H.
J Trauma. 1989 Jul;29(7):981-1000; discussion 1000-2.

Pattern of organ injuries in pelvic fracture: impact force implications for survival and death in motor vehicle injuries.

Siegel JH, Dalal SA, Burgess AR, Young JW.
Accid Anal Prev. 1990 Oct;22(5):457-66.

Week 3- Acetabular Fractures

Chapter 53 Pelvic, Acetabular, and Sacral Fractures

The computerized tomography subchondral arc: a new method of assessing acetabular articular continuity after fracture (a preliminary report).

Olson SA, Matta JM.
J Orthop Trauma. 1993;7(5):402-13.

The effects of simulated transverse, anterior column, and posterior column fractures of the acetabulum on the stability of the hip joint.

Vrahas MS, Widding KK, Thomas KA.
J Bone Joint Surg Am. 1999 Jul;81(7):966-74.

Week 4- Hip Fractures

Femur Fractures

Chapter 54 – Hip Dislocations and Femoral Head Fractures

Chapter 55 – Fractures of the Hip

Chapter 56 – Fractures of the Femoral Shaft and Distal Femur

The value of the tip-apex distance in predicting failure of fixation of peritrochanteric fractures of the hip.

Baumgaertner MR, Curtin SL, Lindskog DM, Keggi JM.
J Bone Joint Surg Am. 1995 Jul;77(7):1058-64.

Early versus delayed stabilization of femoral fractures. A prospective randomized study.

Bone LB, Johnson KD, Weigelt J, Scheinberg R.
J Bone Joint Surg Am. 1989 Mar;71(3):336-40.

Adult respiratory distress syndrome, pneumonia, and mortality following thoracic injury and a femoral fracture treated either with intramedullary nailing with reaming or with a plate. A comparative study.

Bosse MJ, MacKenzie EJ, Riemer BL, Brumback RJ, McCarthy ML, Burgess AR, Gens DR, Yasui Y.
J Bone Joint Surg Am. 1997 Jun;79(6):799-809.

The association between supracondylar-intercondylar distal femoral fractures and coronal plane fractures.

Nork SE, Segina DN, Aflatoon K, Barei DP, Henley MB, Holt S, Benirschke SK.
J Bone Joint Surg Am. 2005 Mar;87(3):564-9.

Week 5- Tibia Fractures

Chapter 57 – Knee Dislocations and Patella Fractures

Chapter 58 – Tibial Plateau and Tibia-Fibula Shaft Fractures

Intramedullary nailing of proximal quarter tibial fractures.

Nork SE, Barei DP, Schildhauer TA, Agel J, Holt SK, Schrick JL, Sangeorzan BJ.
J Orthop Trauma. 2006 Sep;20(8):523-8.

[Randomized trial of reamed and unreamed intramedullary nailing of tibial shaft fractures.](#)

Study to Prospectively Evaluate Reamed Intramedullary Nails in Patients with Tibial Fractures Investigators, Bhandari M, Guyatt G, Tornetta P 3rd, Schemitsch EH, Swiontkowski M, Sanders D, Walter SD.

J Bone Joint Surg Am. 2008 Dec;90(12):2567-78.

Recombinant human bone morphogenetic protein-2 for treatment of open tibial fractures: a prospective, controlled, randomized study of four hundred and fifty patients.

Govender S, Csimma C, Genant HK, et. al. BMP-2 Evaluation in Surgery for Tibial Trauma (BESTT) Study Group.
J Bone Joint Surg Am. 2002 Dec;84-A(12):2123-34.

Frequency and fracture morphology of the posteromedial fragment in bicondylar tibial plateau fracture patterns.

Barei DP, O'Mara TJ, Taitsman LA, Dunbar RP, Nork SE.
J Orthop Trauma. 2008 Mar;22(3):176-82.

Complications associated with internal fixation of high-energy bicondylar tibial plateau fractures utilizing a two-incision technique.

Barei DP, Nork SE, Mills WJ, Henley MB, Benirschke SK.
J Orthop Trauma. 2004 Nov-Dec;18(10):649-57.

The value of the ankle-brachial index for diagnosing arterial injury after knee dislocation: a prospective study.

Mills WJ, Barei DP, McNair P.
J Trauma. 2004 Jun;56(6):1261-5.

Week 6- Malunions, Nonunions, Infections

Prevention of Complications of Orthopaedic Trauma

Chapter 61 – Nonunions, Osteomyelitis, and Limb Deformity Analysis

The clamshell osteotomy: a new technique to correct complex diaphyseal malunions.

Russell GV, Graves ML, Archdeacon MT, Barei DP, Brien GA Jr, Porter SE.
J Bone Joint Surg Am. 2009 Feb;91(2):314-24.

Week 7- Pilon Fractures

Hindfoot Fractures

Midfoot Fractures

Chapter 59 – Foot Trauma

Chapter 60 – Fractures of the Ankle and Tibial Plafond

A prospective study evaluating incision placement and wound healing for tibial plafond fractures.

Howard JL, Agel J, Barei DP, Benirschke SK, Nork SE.
J Orthop Trauma. 2008 May-Jun;22(5):299-305; discussion 305-6.

Talar neck fractures: results and outcomes.

Vallier HA, Nork SE, Barei DP, Benirschke SK, Sangeorzan BJ.
J Bone Joint Surg Am. 2004 Aug;86-A(8):1616-24.

Fractures of the calcaneus.

Barei DP, Bellabarba C, Sangeorzan BJ, Benirschke SK.
Orthop Clin North Am. 2002 Jan;33(1):263-85, x. Review.

Operative compared with nonoperative treatment of displaced intra-articular calcaneal fractures: a prospective, randomized, controlled multicenter trial.

Buckley R, Tough S, McCormack R, Pate G, Leighton R, Petrie D, Galpin R.
J Bone Joint Surg Am. 2002 Oct;84-A(10):1733-44.

Week 8 - Fractures of the Shoulder Girdle

Humerus Fractures

Chapter 52 – Fractures of the Humeral Shaft and Distal Humerus

Nonoperative treatment compared with plate fixation of displaced midshaft clavicular fractures. A multicenter, randomized clinical trial.

All readings are from the American Academy of Orthopaedic Surgeons Comprehensive Orthopaedic Review unless otherwise specified.

5. Didactic Activities

Board Rounds

All inpatient consultations and Emergency Department consultations are presented formally by the on-call residents every weekday. Board Rounds are attended by faculty from the adult service, pediatric service, and hand service at the Johns Hopkins Hospital. Resident attendance is mandatory from each of these services. Elements of the patient's history, physical examination, and radiographs are discussed. Residents and attendings engage in relevant clinical discussion regarding each patient. The plan for each patient is formalized and coordinated one of the three teams present.

Weekly Orthopaedic Trauma Didactics

Wednesday morning didactic sessions are held prior to clinic on a weekly schedule. The topic of discussion centers on the weekly reading schedule. Additionally, orthopaedic trauma skills are demonstrated during this session. PGY-2 and PGY-5 residents on the service must attend. Residents are responsible for the weekly reading and for participating in the discussion. The attending will present the topic and lead the discussion.

Journal Club

Journal Club is held on an evening during the 8-week trauma block. The topic of discussion and relevant journal articles are selected to supplement the education provided by clinical exposure during that trauma block. An attempt is made to minimize redundancy in articles and topical discussion. Residents off-service are encouraged to attend as they are able, based on resident work hours restrictions.

Motor Skills Lab

Hands-on orthopaedic trauma skills labs are fully explained in other modules of the resident manual.

6. Schedule – Orthopaedic Trauma Service

Monday

0645 – 0715: Board Rounds

0730 – End of Day: Trauma Operating Room

Timing Based on Clinical Activity: Faculty Supervised Rounds

Tuesday

0700 – 0715: Board Rounds

0730 – End of Day: Trauma Operating Room

Timing Based on Clinical Activity: Faculty Supervised Rounds

Wednesday

0700 – 0715: Board Rounds

0715 – 0815: Weekly Orthopaedic Trauma Didactics

0815 – 1800: Orthopaedic Trauma Clinic

Timing Based on Clinical Activity: Faculty Supervised Rounds

Thursday

0600 – 0615: Board Rounds

0630 – 1100: Resident Didactics

1200 – 1700: Orthopaedic Trauma Clinic

Timing Based on Clinical Activity: Faculty Supervised Rounds

[0830 – End of Day: Trauma Operating Room (attended by residents as available)]

Friday

0700 – 0715: Board Rounds

0730 – End of Day: Trauma Operating Room

Timing Based on Clinical Activity: Faculty Supervised Rounds

Saturday

Clinical care managed by the on-call faculty and resident team

Timing Based on Clinical Activity: Faculty Supervised Rounds

Sunday

Clinical care managed by the on-call faculty and resident team

Timing Based on Clinical Activity: Faculty Supervised Rounds