Educational Goals & Objectives

Orthopedic surgeons are specialists in acute and chronic disorders of the bones, joints, tendons and ligaments. These conditions may be congenital, reflect overuse or trauma, or be a result of aging or systemic disease. Our Orthopedics Surgery Residency at Community Memorial Hospital will provide the resident with a foundation in basic science, anatomy, pathology, and biomechanics, with special expertise in the clinical care of patients with musculoskeletal disorders. The goal of the residency is to provide exposure to a broad base of orthopedic learning and to encourage critical thinking, such that graduates can provide compassionate care at the forefront of orthopedic knowledge. Rotations at the onset of training encompass a variety of specialties, including Critical Care, Emergency Medicine, Family Practice, General Orthopedics, Pediatrics, General Surgery, Infectious Diseases, Internal Medicine, Neurology, Neurosurgery, Plastic Surgery, Physical Medicine, Radiology, Rheumatology, and Vascular Surgery to provide the resident with a comprehensive skill set to foster further training. Subsequent rotations concentrate on Orthopedic Surgery and its specialties in both inpatient and outpatient settings to ensure mastery of the diagnosis and management of musculoskeletal disease. Focus will be on learning normal and abnormal anatomy, understanding the natural history of musculoskeletal disease (untreated, treated medically, and treated surgically), gaining expertise in multiple procedural skills, and achieving excellence in the prevention, treatment and rehabilitation of musculoskeletal disease.

Faculty will facilitate learning in the 6 core competencies as follows:

Patient Care and Procedural Skills

I. All residents must be able to provide compassionate, culturally-sensitive, and appropriate care for patients with musculoskeletal disorders, from pediatrics through geriatrics.
   - R2s should seek directed and appropriate medical consultation when necessary to further patient care.
   - R3s should facilitate seamless transitions of care between the patient’s primary care physician and the consultant and between inpatient and outpatient care.
   - R4s should seek timely subspecialty orthopedic consultation as appropriate to further patient care.
   - R5s will provide guidance in patient assessment to more junior members of the team.

II. Residents will demonstrate the ability to take a pertinent history and perform a systematic physical exam, with emphasis on the musculoskeletal and neurologic exams. R1s should be able to elicit the timing, intensity, and impact on functional status of a patient’s symptoms. R1s should also be able to obtain the following historical details:
   - Joint, muscular, and neuropathic symptoms
   - Systemic symptoms, such as fatigue, fever, poor sleep, sweats, or weight loss
   - Occupational history, and history of repetitive use
   - History of antecedent events, such as trauma and exercise or sports injury
• Family or personal history of autoimmune disease
• History of drug and alcohol use

R2s should be able to
• Identify exam findings consistent with normal growth and musculoskeletal development in children
• recognize the contribution of comorbidities and medication compliance to a patient’s symptoms
• differentiate inflammatory from mechanical joint pain
• identify the mechanism of injury in trauma
• perform an appropriately targeted physical exam prior to sports participation
• perform a primary and secondary trauma survey and use multiple trauma evaluation and scoring scales

R3s should be able to
• independently obtain the above details for patients with a complex medical history
• recognize patients that need medical co-management for operative intervention
• perform an appropriately targeted history and physical prior to emergency surgery
• competently take an interim history when a patient has a change in condition postoperatively
• be aware of possible hidden injuries during secondary survey in trauma

R4s should develop expertise in caring for patients with complex orthopedic issues, such as victims of multiple traumas, patients with cancer, and patients requiring reconstruction.

R5s should be able to demonstrate the above skills independently.

III. Residents should be able to characterize the following physical exam findings:

R1s
• Abnormal posture or gait
• Baker’s cyst
• Bunion
• Clubbing
• Dislocation
• Dupuytren’s contracture
• Foot drop
• Fracture
• Ganglion
• Hematoma
• Joint abnormalities, including Bouchard and Heberden’s nodes, crepitus, instability, effusion, limited range of motion, subluxation, and ulnar deviation
• Kyphosis
• Muscle atrophy
- Nail pitting
- Scoliosis
- Tendonitis
- Tophi

R2s should be familiar with muscle action and innervation as reflected on physical exam, as well as physical exam findings of or maneuvers to evaluate for
- Sciatica, sacroiliac joint pathology, and spondylosis
- Cauda equina and conus medullaris syndrome
- Hip muscle flexibility and gluteus medius weakness
- Lower extremity arthritis and ligamentous and meniscal injuries
- Limitations in joint range of motion and flexibility
- Patellofemoral problems
- Leg length discrepancy
- Acromioclavicular joint pathology, labral tear, shoulder joint instability, rotator cuff disease, and subacromial impingement
- Upper extremity arthritis, epicondylitis, ligamentous tears, tendinitis, and tendinopathies
- Peripheral nerve compression at the carpal, cubital and radial tunnels
- Joint dislocations

R3s should be skilled in the above physical exam objectives as well as
- recognizing common findings in pediatric orthopedics, including those of congenital disease, foot disorders, limb length inequality and deformity, metabolic bone disease, signs of child abuse, and signs of systemic disease
- identifying the mechanism and characteristic findings of common sports medicine injuries, including arthritis; bursitis; impingement, instability, and IT band syndromes; labral, SLAP, meniscal and rotator cuff tears; ligamentous, muscle, and osteochondral injuries; and patellofemoral disorders

R4s should be able to identify physical exam findings characteristic of failed orthopedic intervention.

R5s should be able to identify additional complex and subtle conditions seen in specialized orthopedic practices, including hand and upper extremity, oncology, pediatrics, and sports medicine.

IV. Residents will log between 1000 and 3000 orthopedic surgical cases yearly for years 2 through 5 of their training. Case distribution should include a minimum of 400 arthroscopy cases, 100 hand cases, 100 foot and ankle cases, 100 pediatric cases, 100 trauma cases, and 50 spine cases.
- Residents should become fluent in the anatomy pertinent to the procedure and in explaining procedure indications, contraindications, complications, and limitations, a process that should precede competence in procedure execution.
Residents should learn the surgical approach and operative exposures for all patients for which they provide care.

As residents master new skills and demonstrate competence, they should be prepared to transition from preparing the patient preoperatively, to assisting the attending orthopedic surgeon, to performing appropriate portions of the surgical procedure as directed and supervised by the attending surgeon.

Through the course of their training, residents will become skilled in the independent technical performance of the following procedures:

R1s
- Abscess drainage
- ACLS and BLS
- Arterial line placement
- Central line placement
- Chest tube insertion
- Common injections for bursitis and tendinitis
- Endotracheal intubation
- Sedation and anesthesia in the emergency room
- Simple joint aspirations and injections
- Suturing of lacerations
- Wound irrigation and debridement

R2s
- Application and removal of upper and lower extremity casts
- Application of a pelvic binder
- Arthrocentesis to assess communication of a joint with open wounds
- ATLS
- Closed reduction of upper and lower extremity dislocations, fractures and injuries
- Complex bursal injections, joint aspirations/injections, and injections of trigger finger, carpal tunnel, and base of thumb arthritis
- Debridement of open fractures and wounds and traumatic arthrotomies
- Diagnostic arthroscopy of shoulder, knee, and ankle
- Fasciotomies for compartment syndromes of the upper and lower extremities
- Ganglion excision
- Hematoma block
- Iliac crest bone graft harvest
- Initial surgical dissection of the posterior approach to cervical or lumbar spine
- Insertion of distal femoral and proximal tibial traction pins
- Insertion of lumbar pedicle screws, excluding scoliosis
- Intermedullary nail fixation of simple femoral and tibial fractures
- Leg compartment pressure monitoring
- OR skills, including patient positioning; use of Garner-Wells tongs, Mayfield Pin head holder or headrest; preparing and draping the operative field; performing
basic surgical exposures of open procedures; closing the surgical wound; and applying the dressing

- Plate fixation of humeral and forearm fractures
- Primary joint arthroplasty techniques
- Release of carpal tunnel, first dorsal compartment, trigger finger
- Splinting
- Surgical approach to the hip and knee

R3s, in addition to performing the above procedures skillfully and independently, will hone procedural skills in

- Below the knee and toe amputations
- Intramedullary nail fixation of complex proximal femoral fractures and proximal and distal tibia fractures
- ORIF of distal radius and simple hand injuries, elbow injuries, simple proximal humeral fractures, and ankle fractures

R4s will become competent in

- Anterior cervical discectomy and posterior cervical fusion with lateral mass screws between C3 and C6
- Combined ligament reconstruction; PL corner repair/reconstruction; and posterior cruciate ligament reconstruction
- Excision of dorsal and volar ganglion
- Halo application
- Hip arthroscopy
- Lumbar microdiscectomy, lumbar laminectomy and 1 or 2 level instrumented lumbar fusion
- Meniscal allograft
- Primary joint arthroplasty and revision
- ORIF of complex proximal humeral fractures, periarticular elbow fractures, hand injuries and mid-and forefoot injuries; intra-articular distal radius and knee fractures; simple acetabulum fractures and pelvic ring injuries; and talus and calcaneal fractures
- Tendon transfers for radial and combined median-ulnar nerve paralysis
- Thumb MP arthrodesis and MCP interposition arthroplasty
- Wrist arthroscopy

R5s will act as Chief Resident and supervise more junior residents in the care of the conditions above.

Medical Knowledge

I. R1s will develop an approach to the evaluation and treatment of the following presenting conditions:

- Back or neck pain, acute and chronic
- Joint erythema, pain, swelling, or stiffness
- Muscle weakness, pain or swelling
- Musculoskeletal trauma, fractures and dislocations
- Overuse syndromes

R1s will explore the basic pathophysiology, clinical presentation, and treatment of more common conditions, such as Baker's cyst, bursitis, carpal tunnel syndrome, costochondritis, deep venous thrombosis and pulmonary embolus, diabetic foot ulcer, ganglion cyst, hallux valgus, labral and meniscal tears, plantar fasciitis, Morton's neuroma, osteoarthritis, osteoporosis and vertebral compression fracture, rotator cuff tear, scoliosis, tendonitis, and trigger finger.

R1s will become familiar with operating room procedures, including
- Basic patient positioning
- Estimation of blood loss
- Function and types of instruments, drains and dressings
- Induction of anesthesia
- Preparing and draping the operative field

II. R2s will also develop a more complete understanding of the pathophysiology, clinical presentation, differential diagnosis, therapy, and prognosis for the following conditions:
- Adhesive capsulitis
- Avascular necrosis
- Compartment syndrome
- Greater trochanteric pain syndrome
- Growth plate injury
- Myelopathy
- Myofascial strain
- Nerve injuries
- Osteochondroma
- Osteomyelitis
- Radiculopathy and disk herniation
- Sacroiliac dysfunction
- Septic arthritis and bursitis
- Simple fractures
- Spinal cord injury
- Spinal stenosis
- Spondyloarthropathies
- Tendinosis, and tendon rupture

R2s will develop an approach to the timely triage, evaluation, stabilization, and treatment of trauma patients.

R2s will understand normal growth and development of the musculoskeletal system and demonstrate an understanding of conditions commonly affecting children, including:
• Diagnosis and management of simple fractures and torsional abnormalities
• Diagnosis and treatment of musculoskeletal infections

III. R3s will also
• recognize musculoskeletal manifestations of systemic diseases, such as acromegaly, diabetes (Charcot joint), gout, hemochromatosis, infection (HIV, parvovirus, Strep), neurofibromatosis, Paget’s Disease, psoriatic arthritis, rheumatoid arthritis, and thyroid disease
• be familiar with the prevention and treatment of common injuries in sports medicine
• understand the criteria for establishing stability in pelvic ring injuries and the indications for operative treatment of pelvic and acetabular fractures
• understand treatment options for painful hardware
• diagnose and understand the natural history and management of the following conditions seen in pediatric orthopedics: simple bone cysts, benign bony tumors, clubfoot and other common foot disorders, common neuromuscular disorders, and limb length inequality and deformity
• demonstrate competence in the emergent care of patients with acute neurological syndromes associated with cauda equina and conus medullaris syndrome, dislocations, fractures, metastatic tumors and spinal infections

IV. R4s will demonstrate competence in the following areas:
• Recognizing a musculoskeletal emergency and planning and executing an appropriate, timely plan of care
• Diagnosing and treating complex post-traumatic disorders, including failure of fixation, heterotopic ossification, nonunion, pain, osteomyelitis, and post-traumatic arthritis
• Diagnosing and treating acetabular dysplasia and femoral acetabular impingement
• Recognizing and treating complex pediatric orthopedic disorders, including cerebral palsy, hematologic disorders, juvenile rheumatoid arthritis, muscular dystrophy, myelomeningocele, neuromuscular disorders, skeletal dysplasia, spinal deformities, and sports medicine injuries
• Recognizing and treating subtle and challenging conditions of the upper and lower extremities, with special attention to diagnosis and treatment options for hand and wrist conditions, including:
  • Arthritis
  • Boutonniers deformity
  • Dupuytren’s disease
  • Dynamic carpal instability
  • Flexor tendon injuries
  • Fractures and malunions of the distal radius
  • Fractures of the scaphoid, phalanges, and the base of the thumb
  • Osteonecrosis of the carpus
  • Radial Tunnel Syndrome
  • Rheumatoid arthritis
- Stroke hand
- Tumors
- Ulnar sided wrist pain and instability
- Recognizing and treating complex spine disorders, including adjacent segment degeneration, failed back syndrome, flat back syndrome, post-traumatic kyphosis, and pseudoarthrosis

V. R5s will act as Chief Resident and develop proficiency in caring for patients with complex conditions as well as supervise more junior residents in their care.

VI. R3s and R4s will, in addition, gain advanced skills in more complex diagnoses in pediatric orthopedics, including
- Recognizing and managing bone defects, complex bone cysts, malignant tumors, and upper and lower limb deformities and disorders
- Understanding the clinical manifestations, treatment, and prognosis of complex gait disorders, congenital anomalies and developmental deformities, complex fractures, Legg Perthes disease, complicated limb length issues, scoliosis, and tumors

Residents will have initial exposure during the R3 year and assume graded clinical responsibility as they rotate again on pediatric orthopedics in the R4 year.

VII. Residents will understand the natural history of acute and chronic musculoskeletal problems with an appreciation of the expected course with and without therapy. Residents will learn the following principles of management and therapy for musculoskeletal disease:
- Use of braces, casts, splints, orthotics, and elasticized bandage and taping
- Use of prosthetics, assist devices, and durable medical equipment for temporary or chronic disability
- Risks and benefits of medical/conservative therapies, surgical treatment, and alternative and complementary therapies
- Prescription of specific rehabilitation programs

VIII. Residents will demonstrate knowledge of perioperative care including
- Preoperative patient preparation, e.g. NPO, and appropriate dosing of perioperative medications, particularly antiplatelet agents and anticoagulants, antihypertensive medications, and hypoglycemic medications
- Preoperative templating techniques
- Use of perioperative antibiotics
- Postoperative pain control
- Nutrition
- Preventative measures, anticipated timing of, and treatment for intra- and postoperative complications, including
  - Atelectasis
  - Bleeding
- Compartment syndrome
- Complications related to patient positioning intraoperatively, including postoperative neurologic deficits
- Deep venous thrombosis and pulmonary embolus
- Dural tear/CSF fistula
- Epidural hematoma
- Ileus and severe constipation
- Superficial and deep wound infection
- Appropriate use of weight bearing restrictions and physical therapy techniques
- Use of heat and cold
- Timing of postoperative outpatient follow-up and anticipated care

IX. R1 will be able to understand the indications for ordering and the interpretation of the following laboratory values and diagnostic studies:
- Analysis of synovial fluids
- CBC with peripheral smear
- Chemistries
- Coagulation studies
- EMG and nerve conduction studies
- Imaging with plain films, CT, arthrogram, myelogram, and MRI
- Pathology
- Sedimentation rate and c-reactive protein
- Uric acid
- Urinalysis with microscopy

R2s will understand the use of the above studies within the context of the patient’s changing condition.

R3s will independently, appropriately order studies and be able to interpret results within the context of patient comorbidities, pretest probability of disease, and patient values.

R4s will have a more sophisticated understanding of the utility of pre- and postoperative testing and be able to cogently use initial test results to appropriately order additional testing.

R5s will act as Chief Resident and counsel more junior residents on the appropriate and evidence-based use of laboratory and diagnostic studies.

X. Residents should understand and be able to counsel patients on activity and exercise, prevention of musculoskeletal injury and re-injury, and appropriate use of physical and occupational therapy and rehabilitation.

Practice-Based Learning and Improvement
I. All residents should be able to access current national guidelines (e.g. American Academy of Orthopaedic Surgeons – Research & Quality, Clinical Practice Guidelines http://www.aaos.org/) to apply evidence-based strategies to patient care.

II. R2s should develop skills in evaluating new studies in published literature, through Journal Club and independent study.

III. R3s should become familiar with an increasingly broad range of literature, with a focus on orthopedic subspecialties, such as hand, oncology, pediatrics, reconstruction, spine, sports medicine and trauma.

IV. All residents should participate in case-based therapeutic decision-making and coordinate patient care as part of a larger team, including the primary care provider, physical and occupational therapists, and orthotics/prosthetics specialist to optimize patient care, with R4s taking a leadership role.

V. Residents should participate regularly in Morbidity and Mortality conference, with the goals of analyzing care in a systematic fashion, ensuring that daily practice is evidence-based, and addressing quality issues affecting care. The R5/Chief resident will coordinate this conference.

VI. All residents should respond with positive changes to feedback from members of the healthcare team.

**Interpersonal and Communication Skills**

I. R1s must demonstrate organized and articulate written (electronic) and verbal communication skills that build rapport with patients and families, convey information to other health care professionals, and provide timely documentation in the chart.

II. R2s must also develop interpersonal skills that facilitate collaboration with patients and their families as well as other health professionals.

III. R3s should demonstrate leadership skills to build consensus and coordinate a multidisciplinary approach to patient care. R3s must be able to navigate complex discussions on sensitive topics with patients and their families.

IV. R4s must be able to cogently present complex information to more junior residents as well as to colleagues.

V. R5s should assume responsibility for coordinating OR cases and teaching conferences.

**Professionalism**

I. All residents must demonstrate a commitment to carrying out professional responsibilities.

II. R1s should be able to educate patients in a manner respectful of gender, cultural, religious, economic, and educational differences on choices regarding their care.

III. R2s should also be able to use time efficiently in the clinic to see patients and chart information, and to counsel patients and families on diagnostic and treatment decisions.

IV. Higher level residents should be able to provide constructive criticism and feedback to more junior members of the team.
V. All residents must model a commitment to ethical care, respecting patient autonomy, confidentiality, the need for informed consent, and decisions regarding withholding care.

Systems-Based Practice

I. R1s must have a basic understanding that their diagnostic and treatment decisions involve cost and risk and affect quality of care.

II. R1s must also become familiar with billing and coding and how this process affects reimbursement for the patient and the institution.

III. R2s must demonstrate an awareness of alternative therapies and their costs, risks, and benefits.

IV. R3s must be aware of increasing attention to the quality and value of procedures in orthopedic surgery and maintain a focus on evidence based medicine.

V. R4s must be able to articulate current quality concerns in orthopedic surgery, such as recent guidelines regarding vertebroplasty and the use of arthroscopy to treat degenerative arthritis.

VI. R5s must develop an understanding of current issues regarding access to care, reimbursement for specialty care, increased emphasis on accountability, disclosure of relationships with industry, and tracking outcomes using the National Joint registry.

Teaching Methods

I. Supervised patient care in the inpatient and outpatient setting and in the operating room.
   - Residents will initially be directly observed with patients to facilitate the acquisition of excellent history taking and physical exam skills.
   - As residents become more proficient, they will interact independently with patients and present cases to faculty.
     - Initial emphasis will be on diagnosis and basic management.
     - When residents have mastered these skills, focus will be on medical decision-making and technical skills, and residents will work with supervising physicians to finalize a care plan.
   - All residents will spend supervised time in the operating room, with increasing responsibility as appropriate to their skill level

II. Conferences and Courses
   - Anatomy review
   - Arthroscopy skills lab
   - Basic fracture course
   - Daily noon conference
   - Fracture Conference
   - Journal club
   - M&M
   - Morning report
   - Musculoskeletal radiology review
   - Orthopedic pathology course
III. Research
   • Residents will do a 1 month research elective each year

IV. Independent study
   • AAOS Comprehensive Orthopaedic Review
   • Journal and Textbook reading
     • *Journal of Bone & Joint Surgery*
     • *Spine*
     • *Journal of Spinal disorders and Techniques*
     • *Journal of the AAOS*
     • *Journal of Neurosurgery: Spine*
   • Online educational resources
     • Agency for Healthcare Research and Quality [www.guideline.gov](http://www.guideline.gov)
     • Lieberman’s Learning Lab – Musculoskeletal System
       • [http://eradiology.bidmc.harvard.edu/](http://eradiology.bidmc.harvard.edu/)
   • Up to Date
   • Clinical Key

**Evaluation**
I. Case logs
II. Objective Structured Clinical Exam annually
III. Orthopedic In-training Exam annually
IV. Verbal mid-rotation individual feedback
V. 360 Evaluation biannually
VI. Attending written evaluation of resident regularly throughout the month based on rotation observations and chart review.
VII. Successful participation in and completion of above required conferences and courses

**Schedule**
I. Residents should contact the designated attending for a given rotation the day prior to determine start time and location.
II. Residents should divide their time between the hospital, the operating room, and the clinic as appropriate to achieve the above educational goals.
   • Residents on hospital orthopedic rotations will have rounding responsibilities each day as specified by the attending physician. Residents on the inpatient orthopedic service will perform postoperative checks on the day of surgery for all patients undergoing surgery. Residents will be involved in surgical procedures with increasing independence as appropriate to their level of training.
   • Residents in clinic will have scheduled patients and be involved in discussion of patient presentation, differential diagnosis, decision for or against surgical intervention, and patient follow up.
When possible, residents should follow their patients from preoperative clinic through surgery and subsequently for postoperative care.

Case-based learning is most effective. Nightly reading/study should be based on cases reviewed during the day.

Residents may be asked to do focused literature searches or presentations during the course of the rotation.

When doing consults at the request of colleagues, residents should clarify the question being asked and provide a concise answer.

III. Call and weekend responsibilities TBD by the attending physician.

IV. Residents have noon conferences and should be excused in a timely fashion to attend.