

البحر العربي



SAUDI BOARD ORTHOPAEDIC SURGERY CURRICULUM

PREPARATION

Curriculum Scientific Group

DR. AYMAN HUSSAIN JAWADI
DR. ABDULAZIZ ZAMIL ALOMAR
DR. ALI CHAUDHARY

SUPERVISION

Curriculum Specialist

PROF. ZUBAIR AMIN
DR. SAMI ALSHAMMARI

REVIEWED & APPROVED

Scientific Council

SAMI IBRAHIM AL-ISSA
ABDULLAH SULAIMAN AL-OMRAN
ASIM ALI AL-ZAHIRI
SAEED MOHAMMED KAABAN
MAHMOUD FAROUK SHAHEEN
ABDULAZIZ ZAMEL AL-OMAR
AHMED SALEH BIN NASSER

IBRAHIM, A SUNNI ASIRI
ALI HADI AL-YAMI
ABDULLAH BIN AHMED AL-OTHTMAN
MOUSA MOHAMMED HAWSAWI
ABDULLAH FAHAD RIZZA
THAMER SULEIMAN AL-HUSAINAN

COPYRIGHT AND AMENDMENTS

All rights reserved. © 2017 Saudi Commission for Health Specialties.

This material may not be reproduced, displayed, modified, distributed, or used in any other manner without prior written permission of the Saudi Commission for Health Specialties, Riyadh, Kingdom of Saudi Arabia.

Any amendment to this document shall be approved by the Specialty Scientific Council and the Executive Council of the commission and shall be considered effective from the date the updated electronic version of this curriculum was published on the commission Web site, unless a different implementation date has been mentioned.

Correspondence:

Saudi Commission for Health Specialties

P.O. Box: 94656

Postal Code: 11614

Contact Center: 920019393

E-mail: systemadmin@scfhs.org

Website: www.scfhs.org.sa

Formatted and Designed by:

[Manoj Thomas Varghese, CMT \(SCFHS\)](#) / [Salem M Altamimi \(SCFHS\)](#)

ACKNOWLEDGEMENTS

The Orthopaedic Surgery Curriculum scientific members appreciate the valuable contributions and feedback received from the members of the advisory committee in the construction of this manual. This work could not have been accomplished without their support. We would like to acknowledge that the CanMEDS framework copyright is held by the Royal College of Physicians and Surgeons of Canada, and many of the descriptions and orthopaedic surgery competencies have been adapted from their resources.

TABLE OF CONTENTS

INTRODUCTION	7
TRAINING REQUIREMENTS FOR THE ORTHOPAEDIC SURGERY PROGRAM	8
Major orthopaedic specialties	8
Rotation schedules	9
ROTATION SCHEDULES AND REQUIREMENTS	10
Requirements	10
Learning outcomes of non-orthopaedic rotations	10
OUTCOMES AND COMPETENCIES	12
Rationale	12
Orthopaedic surgery competencies	12
Role no. 1: Medical expert	12
Role no. 2: Communicator	14
Role no. 3: Collaborator	15
Role no. 4: Manager	16
Role no. 5: Health advocate	17
Role no. 6: Scholar	18
Role no. 7: Professional	19
Most commonly performed procedures/surgeries by specialty	20
CORE AND MASTERY LEVEL CLINICAL PROBLEM LIST AND REPRESENTATIVE DISEASES	21
General core topics	21
Arthroplasty (Hip & Knee)	21
Foot and ankle	22
Oncology	23
Pediatric surgery	24
Spine surgery	26
Sports medicine	26
Upper extremity	27
Trauma	29
EXPECTED LEVEL OF COMPETENCY FOR CORE SPECIALTY LEVEL PROBLEMS	31
General orthopaedics	31
Arthroplasty rotation	32
Foot and ankle surgery	35
Oncology	37
Pediatric orthopaedics	38
Spine surgery	39
Sports medicine	41
Upper extremity rotation	45
Trauma	47
Competencies	49
Appendix	51
Resident's logbook	51

TABLE OF CONTENTS

LEARNING OPPORTUNITIES	58
Mission	58
Universal topics	58
Examples of weekly activities	59
Teaching conference	59
Fracture conference	59
Journal club	59
Imaging conference	59
Preoperative and postoperative conferences	59
Tumor conference or sarcoma board	60
Basic Science Course	60
Surgical skills training	60
Journal subscriptions to top orthopaedic journals	60
Core topics	61
ASSESSMENT	63
Types of assessment	Error! Bookmark not defined.
Formative	Error! Bookmark not defined.
Summative	Error! Bookmark not defined.
Progress testing	Error! Bookmark not defined.
OITE	Error! Bookmark not defined.
Annual promotion assessment	Error! Bookmark not defined.
Written examination	Error! Bookmark not defined.
Passing score for the promotion written examination:	Error! Bookmark not defined.
Continuous assessment formats	Error! Bookmark not defined.
Continues evaluation reports (CER)	Error! Bookmark not defined.
Other assessment formats	Error! Bookmark not defined.
Passing score for promotion	Error! Bookmark not defined.
Residents' scholarly activities	Error! Bookmark not defined.
Saudi board part I orthopaedic examination	Error! Bookmark not defined.
Saudi board final orthopaedic examination	Error! Bookmark not defined.
Saudi board part II clinical orthopaedic examination	Error! Bookmark not defined.
OSCE/SQE blueprint:	Error! Bookmark not defined.
Final in-training evaluation report (FITER)/Comprehensive competency report (CCR)	Error!
Bookmark not defined.	
General rules for candidates	Error! Bookmark not defined.
Certification	Error! Bookmark not defined.
Evaluations	65

TABLE OF CONTENTS

APPENDICES	66
Appendix A	66
Appendix B	68
Appendix C	69
Appendix D	71
Appendix E	72
Appendix F	75

INTRODUCTION

Bone and joint diseases that require surgical intervention are numerous in our society. Prevention and treatment of many traumatic injuries and deformities among both adult and pediatric patients will improve the health care in the community. Providing the community with well-trained orthopaedic surgeons was the aim behind the initiation of the first structured orthopaedic surgery residency program in Saudi Arabia on 1 April 1994. It involved all the various health agencies in Riyadh, which are the Ministry of Health, Ministry of Defense and Aviation, Ministry of the National Guard, Ministry of the Interior, King Saud University College of Medicine, and King Faisal Specialist Hospital and Research Center, and it was known as “The Joint Board for Postgraduate Medical Education”. The first committee was composed of 13 members. After several years, the program was expanded to the Western Province (Jeddah, Madinah), Eastern Province, and Southern Province. The initiation of the Saudi Board of Orthopaedic Surgery was discussed by the committee on October 8, 1996, and launched on 1998 under the supervision and bylaws of the Saudi Commission for Health Specialties (SCFHS). Since then, many competent orthopaedic surgeons have graduated from the program, continued their fellowship abroad, and are currently working in and leading the orthopaedic surgery field and teaching in various cities across Saudi Arabia and the Gulf region.

There are several reasons for adopting the CanMEDS framework. The residency program in orthopaedic surgery is currently around 25 years old. The adoption of the CanMEDS framework will aid in the training of individuals who possess certain features in their personal and professional lives. Graduates of the program can attain proficiency as medical experts with skills as communicators, collaborators, health advocates, and scholars.

The curriculum in orthopaedic surgery was modified to include core knowledge in universal topics. Priority will be given to topics relevant to orthopaedic surgery that are of high value, integrated, and interdisciplinary. The format will be didactic and undertaken by the Saudi Commission. Completion of training in the universal topics is required during each trainee’s residency program. The Saudi Commission for Health Specialties (SCFHS) have recognized and accredited a number of centers for residency training in orthopaedic surgery in the Kingdom.

TRAINING REQUIREMENTS FOR THE ORTHOPAEDIC SURGERY PROGRAM

The scope of this structured training program encompasses education in basic sciences, training in cognitive and technical skills, development of clinical knowledge, the acquisition of mature surgical judgment, advanced theoretical knowledge, and responsibility.

The curriculum for the orthopaedic surgery residency training lasts 5 years and includes junior and senior residency rotations. The first 3 years (junior residency) will focus on principles of surgery, basic sciences, general orthopaedics, trauma, and other orthopaedic specialties. There is weekly grand round activity at each hospital, as well as weekly lectures for all residents; residents are expected to prepare and present cases according to a structured schedule during their training. The final 2 years of training (senior residency) will allow senior residents to participate more on emergency and elective admissions in both trauma and other specialties in orthopaedic surgery in addition to their supervision of junior residents and educational organization.

Residents are expected to participate in research throughout the residency without compromising their clinical responsibilities. They are also required to develop and conduct a research project in conjunction with a faculty member of their choice. The research project can involve prospective or retrospective research. Clinical research may lead to important contributions to the field of orthopedics, and residents are expected to complete their thesis during the fourth year of training.

Major orthopaedic specialties

- Adult trauma
- Pediatric orthopaedics
- Spine surgery
- Arthroplasty
- Sport
- Foot and ankle
- Upper extremities
- Orthopaedic oncology

Rotation schedules

First and second year

Rotation	Length
General surgery	3 months
Intensive care unit	3 months
Adult trauma/orthopaedic trauma	3 months
Plastic surgery and/or vascular surgery and/or neurosurgery	3 months
General orthopaedics (sports medicine/arthroplasty/spine)	3 months
General orthopaedics (sports medicine/arthroplasty/spine)	3 months
Orthopaedic trauma	3 months
Pediatric orthopaedics	3 months

Third through Fifth Year

Rotation	Length
Upper extremities	3 months
Spine	3 months
Foot and ankle	3 months
Orthopaedic trauma	3 months × 3 rotations = total of 9 months (one per year)
Pediatric orthopaedics	3 months × 2 rotations = total of 6 months (on different years)
Orthopaedic oncology	3 months
Arthroplasty	3 months
Sports Medicine	3 months
Elective*	3 months

*Elective rotation should be taken in the R3 or R4 training years (this elective may be spent in one of the orthopaedic subspecialties, or in rehabilitation medicine, or where agreed upon by the program director).

ROTATION SCHEDULES AND REQUIREMENTS

Requirements

The orthopaedics residency program is a 5-year program includes all areas of orthopaedic subspecialties. It also incorporates rotations in other non-orthopaedic specialties, which the aim to increase knowledge and proficiency in basic surgical skills, preoperative care of surgical patient, musculoskeletal imaging interpretation, management of ill patients, and airway skills.

It is important to construct a solid framework through which residents progress from one clinical year to the next with a fixed educational plan.

Participation in the OITE (Orthopaedic In-Training Exam) is mandatory for all residents including first-year residents.

Clinical advisors are an important component of the residency program, and can be assigned by the program director of each hospital, with an emphasis on their role in guiding and mentoring residents through their residency training and discussing reports of the OITE examination, providing resources and guidance for successful improvement through the academic year. Every clinical advisor should be chosen with regard to their availability and willingness to participate in the educational process.

Learning outcomes of non-orthopaedic rotations

During the first 2 years of the orthopaedics program, residents have 9 months of rotations in non-orthopaedic specialties to help develop knowledge and skills in areas associated with orthopaedics.

These rotations include:

- General surgery and acute care
- Plastic surgery
- Intensive care unit

ROTATION SCHEDULE AND REQUIREMENTS

Rotation	Learning outcomes
General surgery and acute care	<ul style="list-style-type: none"> Assessment of the multiply injured patient Superficial sepsis, including necrotizing infections Nutrition Assessment of the acute abdomen (history, examination, and resuscitation) Assessment of patients with possible intra-abdominal injuries Treatment of benign lesions of the skin and subcutaneous tissues Electrolyte imbalance Basic surgical instruments and surgical skills
Plastic surgery	<ul style="list-style-type: none"> Examination of the injured hand V-Y advancement Digital nerve block Primary repair of the extensor tendon Primary repair of the flexor tendon Principles of tendon transfer Wound exploration and debridement Principles of skin graft and muscle flap
Intensive care unit	<ul style="list-style-type: none"> Airway management Basic ventilation settings Early recognition of a septic patient Circulatory support Acid-base imbalance

OUTCOMES AND COMPETENCIES

Rationale

The responsibility of the orthopaedic surgeon is to maintain and restore proper function of the musculoskeletal system in patients of all ages. There are various subspecialties or subdivisions including fractures, arthritis, soft-tissue processes, tumors, metabolic conditions, congenital disorders, and acquired conditions. A resident in orthopaedic surgery is exposed to various aspects of the specialty, with a variety of experiences ranging from outpatient clinical practice, emergency room situations, and hands-on operative exposure.

Upon completion of training, a resident is expected to be a competent specialist in orthopaedic surgery capable of assuming a consultant's role in the specialty. The resident must acquire a working knowledge of the theoretical basis of the specialty, including its foundations in the basic medical sciences and research. The resident must also demonstrate a satisfactory knowledge of the principles common to all types of surgical practice.

Residents must demonstrate the requisite knowledge, skills, and attitudes for effective patient-centered care and service to a diverse population. In all aspects of specialist practice, the graduate must be able to address issues of gender, age, and ethics in a professional manner.

Orthopaedic surgery competencies

At the completion of training, the resident will have acquired the following competencies and will function effectively as a:

Role no. 1: Medical expert

Medical Expert is the central physician role in the CanMEDS framework. Orthopaedic surgeons integrate all of the CanMEDS roles, applying medical knowledge, clinical skills, and professional attitudes in their provision of patient-centered care.

Key and Enabling Competencies: Orthopaedic Surgeons are able to:

- 1) **Function effectively as consultants, integrating all of the CanMEDS roles to provide optimal, ethical, and patient-centered medical and surgical care**
 - Perform consultation effectively, including the presentation of well-documented assessments and recommendations in written and/or verbal form in response to a request from another health care professional
 - Demonstrate effective use of all CanMEDS competencies relevant to orthopaedic surgery
 - Identify and appropriately respond to relevant ethical issues arising in patient care
 - Demonstrate the ability to effectively and appropriately prioritize professional duties when faced with multiple patients and problems
 - Demonstrate compassionate and patient-centered care
 - Recognize and respond to the ethical dimensions in medical decision-making

- 2) **Establish and maintain clinical knowledge, skills, and attitudes appropriate to orthopaedic surgery:**
- Describe the CanMEDS framework of competencies relevant to orthopaedic surgery
 - Apply the lifelong learning skills of the Scholar Role to implement a personal program to stay up-to-date and enhance areas of professional competence
 - Contribute to the enhancement of quality care and patient safety in orthopaedic surgery, integrating the available best evidence and best practices
- 3) **Perform a complete and appropriate patient assessment**
- Identify and explore issues to be addressed in a patient encounter effectively, including the patient's context and preferences
 - Elicit a history that is relevant, concise, and accurate with regard to context and preferences for the purposes of prevention and health promotion, diagnosis, and/or management
 - Perform a focused physical examination that is relevant and accurate for the purposes of prevention and health promotion, diagnosis, and/or management
 - Select medically appropriate investigative methods in a resource-effective and ethical manner
 - Demonstrate effective clinical problem-solving and judgment to address patient problems, including interpreting available data and integrating information to generate differential diagnoses and management plans
- 4) **Use preventive and therapeutic interventions effectively**
- Implement an effective management plan in collaboration with a patient and their family
 - Demonstrate effective, appropriate, and timely application of preventive and therapeutic interventions relevant to orthopaedic surgery
 - Ensure appropriate informed consent is obtained for therapies
 - Ensure patients receive appropriate end-of-life care
- 5) **Demonstrate proficient and appropriate use of procedural skills in both diagnostic and therapeutic procedures relevant to orthopaedic surgery**
- Ensure informed consent is obtained for procedures
 - Document and disseminate information related to procedures performed and their outcomes
 - Ensure adequate follow-up is arranged for procedures performed
- 6) **Seek appropriate consultation from other health professionals, recognizing the limits of their expertise**
- Demonstrate insight into their own limitations of expertise
 - Demonstrate effective, appropriate, and timely consultation of another health professional as needed for optimal patient care
 - Arrange appropriate follow-up care services for a patient and their family
 - Describe the limitations of practice in a community setting based on resources
 - Demonstrate appropriate transfer of care of a patient to tertiary care where applicable

Role no. 2: Communicator

As Communicators, orthopaedic surgeons effectively facilitate the doctor-patient relationship and the dynamic exchanges that occur before, during, and after the medical encounter.

- 1) **Key and Enabling Competencies: Orthopaedic Surgeons are able to develop rapport, trust, and ethical therapeutic relationships with patients and families**
 - Recognize that being a good communicator is a core clinical skill for physicians, and that effective physician-patient communication can foster patient satisfaction, physician satisfaction, adherence, and improved clinical outcomes
 - Establish positive therapeutic relationships with patients and their families that are characterized by understanding, trust, respect, honesty, and empathy
 - Respect patient confidentiality, privacy, and autonomy
 - Listen effectively
 - Be aware and responsive to nonverbal cues
 - Facilitate a structured clinical encounter effectively

- 2) **Accurately elicit and synthesize relevant information and perspectives of patients and families, colleagues, and other professionals**
 - Gather information about a disease, but also about a patient's beliefs, concerns, expectations, and illness experience
 - Recognize the emotional stress for patients and families faced with orthopaedic conditions and their associated surgical management, particularly in the treatment of children
 - Seek out and synthesize relevant information from other sources, such as a patient's family, caregivers, and other professionals

- 3) **Convey relevant information and explanations accurately to patients and families, colleagues, and other professionals**
 - Deliver information to a patient and family, colleagues, and other professionals in a humane manner and in such a way that it is understandable and encourages discussion, and participation in decision-making
 - Demonstrate effective, age-appropriate communication of treatment plans to pediatric patients
 - Demonstrate cooperation and communication between health professionals involved in the care of individual patients such that consistent messages are delivered to patients and their families

- 4) **Develop a common understanding on issues, problems, and plans with patients, families, and other professionals to develop a shared plan of care**
 - Identify and explore problems to be addressed from a patient encounter effectively, including the patient's context, responses, concerns, and preferences
 - Respect diversity and differences in decision-making
 - Encourage discussion, questions, and interaction in the encounter

- Engage patients, families, and relevant health professionals in shared decision-making to develop a plan of care
- Address challenging communication issues effectively, such as obtaining informed consent; delivering bad news; and addressing anger, confusion, and misunderstanding
- Obtain informed consent for surgical procedures, appreciating alternative means of achieving consent if the patient is unable to provide consent on the grounds of age, mental status, or other disqualifiers
- Discuss advanced directives and end-of-life issues with patients and families, such as “do not resuscitate” orders.

5) **Convey effective oral and written information about a medical encounter**

- Maintain clear, concise, accurate, and appropriate records (written or electronic) of clinical encounters and plans
- Write well-organized and legible orders and progress notes
- Complete concise hospital discharge summaries promptly
- Write well-organized letters, providing clear directions where indicated
- Present verbal reports of clinical encounters and plans effectively

Role no. 3: Collaborator

As Collaborators, orthopaedic surgeons effectively work within a healthcare team to achieve optimal patient care.

Key and Enabling Competencies: Orthopaedi: Surgeons are able to:

- 1) **Participate effectively and appropriately in an interprofessional healthcare team**
 - Describe the specialist’s roles and responsibilities to other professionals
 - Describe the roles and responsibilities of other professionals within the health care team
 - Recognize and respect the diversity of roles, responsibilities and competences of other professionals in relation to their own
 - Recognize the limitations of their professional competence
 - Work with others to assess, plan, provide and integrate care for individual patients
 - Work effectively as a team member when not in a team leadership role
 - Work with others to assess, plan, provide and review other tasks, such as research problems, educational work, program review or administrative responsibilities
 - Participate in morbidity and mortality reviews
 - Participate effectively in interprofessional team meetings
 - Enter into interdependent relationships with other professions for the provision of quality care
 - Describe the principles of team dynamics
 - Respect team ethics, including confidentiality, resource allocation and professionalism
 - Demonstrate leadership in a healthcare team
- 2) **Work effectively with other health professionals to prevent, negotiate, and resolve interprofessional conflict**
 - Demonstrate a respectful attitude towards other colleagues and members of an interprofessional team

- Work with other professionals to prevent conflicts
- Employ collaborative negotiation to resolve conflicts
- Respect differences and address misunderstandings and limitations in other professionals
- Recognize one's own differences, misunderstanding and limitations that may contribute to interprofessional tension
- Reflect on interprofessional team function

Role no. 4: Manager

As Managers, orthopaedic surgeons are integral participants in healthcare organizations, organizing sustainable practices, making decisions about resource allocation, and contributing to the effectiveness of the healthcare system.

Key and Enabling Competencies: Orthopaedic Surgeons are able to

- 1) Participate in activities that contribute to the effectiveness of their healthcare organizations and systems**
 - Work collaboratively with others in their organizations
 - Participate in systematic quality process evaluation and improvement, such as patient safety initiatives
 - Describe the structure and function of the healthcare system as it relates to orthopaedic surgery, including the roles of physicians
 - Explain population-based approaches to healthcare services and their implication for medical practice
- 2) Manage their practice and career effectively**
 - Set priorities and manage time to balance patient care, practice requirements, outside activities, and personal life
 - Manage patients' length of stay efficiently
 - Manage surgical waiting lists efficiently
 - Manage a practice including finances and human resources where applicable
 - Explain the principles of practice management including independent practice, hospital-based practice, or group practice
 - Describe basic principles of providing/receiving references
 - Demonstrate an ability to access and apply a broad base of information to the care of patients in hospitals and other healthcare settings
 - Employ information technology appropriately for patient care
- 3) Allocate finite healthcare resources appropriately**
 - Recognize the importance of just allocation of healthcare resources, balancing effectiveness, efficiency, and access with optimal patient care
 - Apply evidence and management processes for cost-appropriate care

- 4) **Serve in administration and leadership roles**
- Chair or participate effectively in committees and meetings
 - Lead or implement change in healthcare
 - Plan relevant elements of healthcare delivery (e.g., work schedules)

Role no. 5: Health advocate

As Health Advocates, orthopaedic surgeons responsibly use their expertise and influence to advance the health and well-being of individual patients, communities, and populations.

Key and Enabling Competencies: Orthopaedic Surgeons are able to:

- 1) **Respond to individual patient health needs and issues as part of patient care**
- Identify the health needs of an individual patient
 - Identify determinants of health particular to an individual patient
 - Adapt patient assessment and management according to particular determinants of health
 - Determine a patient's ability to access various services in the health and social systems
 - Identify opportunities for advocacy, health promotion, and disease prevention with individuals to whom they provide care
 - Promote injury prevention with respect to recreational activities
 - Identify risk factors that can lead to nonunion, ulceration, amputation, Charcot joints, and malignancy, and advise patients on lifestyle modifications to improve outcomes
- 2) **Respond to the health needs of the communities that they serve**
- Identify opportunities for advocacy, health promotion, and disease prevention in the communities that they serve, and respond appropriately
 - Identify workplace factors that lead to an increased risk of trauma
 - Identify sport/recreational factors that lead to an increased risk of trauma
- 3) **Identify the determinants of health for the populations that they serve**
- Identify the psychological, social, and physical determinants of health for the populations that they serve, including barriers to access to care and resources
 - Identify "at-risk" populations within a given orthopaedic practice in conjunction with orthopaedic surgery specialty societies and other associations
 - Identify vulnerable or marginalized groups within the population served and respond appropriately
 - Apply available knowledge regarding prevention to "at-risk" groups
 - Contribute to the generation of population-based data for improved understanding of orthopaedic problems within "at-risk" populations
- 4) **Promote the health of individual patients, communities, and populations**
- Describe an approach to implementing a change in a determinant of health for the populations they serve .

- Explain the need to advocate to decrease the burden of illness (at a community or societal level) of a condition or problem relevant to orthopaedics through a relevant orthopaedic society, community-based advocacy group, other public education bodies, or private organizations
- Identify points of influence in the healthcare system and its structure
- Describe the role of the medical profession in advocating collectively for health and patient safety

Role no. 6: Scholar

As Scholars, orthopaedic surgeons demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application, and translation of medical knowledge.

Key and Enabling Competencies: Orthopaedic Surgeons are able to:

- 1) **Maintain and enhance professional activities through ongoing learning**
 - Describe re-registration requirements for the Saudi Commission for Health Specialties
 - Formulate relevant personal learning projects
 - Recognize and reflect on learning issues in practice
 - Pose an appropriate learning question
 - Access and interpret the relevant evidence
 - Integrate new learning into practice
 - Recognize and correct deficits in knowledge and technical skills through targeted learning
 - Evaluate the impact of any change in practice
 - Document the learning process
- 2) **Evaluate medical information and its sources critically, and apply this appropriately to practice decisions**
 - Describe the principles of critical appraisal
 - Critically appraise retrieved evidence in order to address a clinical question
 - Integrate critical appraisal conclusions into clinical care
- 3) **Facilitate the learning of patients, families, students, residents, other health professionals, the public, and others**
 - Describe principles of learning relevant to medical education
 - Describe the principles of adult learning
 - Discuss teaching models for patient and colleague education
 - Identify collaboratively the learning needs and desired learning outcomes of others
 - Select effective teaching strategies and content to facilitate others' learning
 - Contribute to the creation, dissemination, application, and translation of new medical knowledge and practices
 - Demonstrate an effective lecture or presentation
 - Assess and reflect on a teaching encounter
 - Provide effective feedback

- Assess the competence of junior learners working on the orthopaedic team
- Describe the principles of ethics with respect to teaching

4) Contribute to the development, dissemination, and translation of new knowledge and practices

- Describe the principles of research and scholarly inquiry
- Describe the principles of research ethics
- Pose a scholarly question
- Conduct a systematic search for evidence
- Select and apply appropriate methods to address the question
- Disseminate the findings of a study

Role no. 7: Professional

As Professionals, orthopaedic surgeons are committed to the health and well-being of individuals and society through ethical practice, profession-led regulation, and high personal standards of behavior.

Key and Enabling Competencies: Orthopaedic Surgeons are able to:

1) Demonstrate a commitment to their patients, profession, and society through ethical practice

- Exhibit appropriate professional behaviors in practice, including honesty, integrity, commitment, compassion, and respect
- Demonstrate a commitment to delivering the highest-quality care and maintenance of competence
- Recognize and appropriately respond to ethical issues encountered in practice
- Pose an ethical question related to research and discuss the resolution of that question
- Explain the legal, ethical, and professional codes governing a physician's relationship with industry
- Manage conflicts of interest appropriately
- Recognize the principles and limits of patient confidentiality as defined by professional practice standards and governing bodies
- Maintain appropriate relations with patients

2) Demonstrate a commitment to their patients, profession, and society through participation in profession-led regulation

- Appreciate the professional, legal, and ethical codes of practice
- Fulfill the regulatory and legal obligations required of current practice
- Describe the medico-legal obligations associated with non-accidental trauma in children
- Demonstrate accountability to professional regulatory body
- Recognize and respond to others' unprofessional behaviors in practice
- Participate in peer review

- 3) **Demonstrate a commitment to physician health and sustainable practice**
- Balance personal and professional priorities to ensure personal health and a sustainable practice
 - Strive to heighten personal and professional awareness and insight
 - Recognize other professionals in need and respond appropriately

Most commonly performed procedures/surgeries by specialty

The following list of the most commonly performed procedures allows the trainees to focus on what is common and important. The residents should prioritize teaching, learning, and assessment based on the top conditions.

- 1) **Arthroplasty**
 - Primary total joint (hip and knee) arthroplasty
- 2) **Foot and Ankle**
 - Ankle joint arthroscopy
 - Fusion of the first metatarsophalangeal joint
 - Surgeries for hallux valgus
 - Dorsal cheilectomy of the first metatarsophalangeal joint
- 3) **Oncology**
 - Open biopsy of soft-tissue tumor
 - Open biopsy of long-bone tumors
 - Resection of benign soft-tissue tumor
- 4) **Pediatric Orthopaedics**
 - Closed reduction of hip, arthrogram
 - Hip spica application
 - Tendon lengthening (hip adductor, hamstrings, Achilles)
 - Hip arthrotomy
- 5) **Spine Surgery**
 - Primary lumbar discectomy
 - Primary cervical, thoracic, or lumbar laminectomy and decompression of central or peripheral neurologic structures
 - Primary posterior instrumented lumbar fusion
- 6) **Sports Medicine**
 - Diagnostic knee arthroscopy
 - Arthroscopic meniscectomy
- 7) **Trauma**
 - Long bone intramedullary nailing and plating
 - Peri-articular fracture open reduction internal fixation
 - Dynamic hip screw (DHS) and cannulated fixation of femur neck fracture
 - Hip hemiarthroplasty
- 8) **Upper Extremity**
 - Shoulder diagnostic and therapeutic arthroscopy
 - Rotator cuff repair
 - Acromioclavicular joint resection arthroplasty
 - Distal biceps tendon repair

CORE AND MASTERY LEVEL CLINICAL PROBLEM LIST AND REPRESENTATIVE DISEASES

General core topics

- 1) Basic science topics (stem cells in orthopaedics, biomaterials in orthopaedics, cartilage basic science, and therapeutic applications of bone and cartilage substitutes)
- 2) Rehabilitation and physical therapy in orthopaedics (concepts such as open and closed chain exercises, eccentric and isometric muscle contractions, active-assisted therapies, and modalities for pain relief).

Arthroplasty (Hip & Knee)

Core topics:

- 1) Osteoporosis
- 2) Osteoarthritis
- 3) Surgical considerations in medical conditions:
 - Rheumatoid arthritis
 - Ankylosing spondylitis
 - Gout
 - Sickle cell disease
 - Hemophilia
 - HIV
 - Paget's disease
- 4) Metastatic disease
- 5) Complex regional pain syndrome (reflex sympathetic dystrophy)
- 6) Heterotopic ossification
- 7) Deep venous thrombosis
- 8) Osteoarthritis of the knee
- 9) Varus gonarthrosis
- 10) Valgus gonarthrosis
- 11) Extensor mechanism disruption
- 12) Compartment syndrome
- 13) Infectious arthritis
- 14) Osteoarthritis of the hip
- 15) Post-traumatic arthrosis
- 16) Avascular necrosis of the femoral head
- 17) Intertrochanteric femur fracture
- 18) Infectious arthritis of the hip

Mastery level topics

- 1) Post-traumatic arthrosis of the knee
- 2) Spontaneous osteonecrosis of the femoral condyle
- 3) Post-traumatic arthrosis of the hip
- 4) Acetabular dysplasia
- 5) Painful total joint arthroplasty

- 6) Loose total joint arthroplasty
- 7) Unstable total joint arthroplasty
- 8) Infected total joint arthroplasty
- 9) Demonstrate competency in preoperative planning:
 - Identify type of prosthesis to be used
 - Perform preoperative templating
 - Discuss the alternative surgical approaches
- 10) Revision total hip and knee arthroplasty
 - Preoperative planning
 - Implant choice
 - Use of allograft
 - Vascularized free fibula grafting
 - Advanced fracture fixation methods
- 11) Hip and knee arthrodesis
- 12) Resection arthroplasty of the hip and knee

Foot and ankle

Core topics:

- 1) Anatomy and biomechanics of the foot and ankle
- 2) Gait biomechanics
- 3) History and physical examination of the foot and ankle
- 4) Radiographic assessment of foot and ankle conditions
- 5) All fractures and dislocations around the foot and ankle
- 6) Ankle sprains
- 7) High ankle sprains
- 8) Midfoot sprains
- 9) Diagnosis and non-operative treatment of Hallux valgus
- 10) Inflammatory arthropathy of the foot and ankle
- 11) Post-traumatic arthropathy of the foot and ankle
- 12) Primary arthritis of the foot and ankle
- 13) Diagnosis and non-operative treatment of posterior tibial tendon dysfunction
- 14) Diagnosis and non-operative treatment of chronic lateral ankle instability
- 15) Diagnosis and non-operative treatment of cavus foot
- 16) Diagnosis and non-operative treatment of Charcot arthropathy
- 17) Plantar fasciitis and heel pain
- 18) Acute Achilles tendon rupture
- 19) Diabetic foot ulcers

Mastery level topics:

- 1) Hallux valgus
- 2) Diagnosis and outline of hallux varus management
- 3) Turf toe
- 4) Sesamoid injuries of the big toe
- 5) Lesser toe deformities (mallet toe, hammer toe, claw toe)
- 6) Morton's neuroma

- 7) Nerve entrapment about the ankle (e.g., tarsal tunnel syndrome, entrapment of the calcaneal branches, etc.)
- 8) Charcot-Marie-Tooth disease
- 9) Neuro-muscular deformities of the foot
- 10) Etiology and diagnosis of metatarsalgia
- 11) Crystalline-induced arthropathy of the foot and ankle
- 12) Posterior tibial tendon dysfunction
- 13) Chronic lateral ankle instability
- 14) Cavus foot
- 15) Charcot arthropathy
- 16) Complications of calcaneal fractures
- 17) Complications of pilon fractures
- 18) Complications of talar fractures
- 19) Peroneal tendon pathology (tendinosis and instability)
- 20) Tibialis anterior tendinosis
- 21) Flexor hallucis tendon injuries
- 22) Achilles tendinopathy (insertional and non-insertional)
- 23) Retrocalcaneal bursitis
- 24) Chronic Achilles tendon rupture
- 25) Limited foot amputations
- 26) Ingrown toe nails
- 27) Hallux rigidus
- 28) Osteochondral lesion of the talus
- 29) Osteochondral lesion of the tibial plafond
- 30) Pigmented villonodular synovitis (PVNS) of the ankle
- 31) Anterior ankle impingement
- 32) Posterior ankle impingement
- 33) Spring ligament rupture
- 34) Accessory navicular syndrome (os navicularum syndrome)
- 35) Os peroneal syndrome
- 36) Orthotics and prosthetics (types and indications) for foot and ankle conditions and for lower and upper limb amputations

Oncology

Core Topics:

- 1) Tumor classes and their behavior: primary lesions: benign (latent, active, aggressive), malignant, and metastatic lesions
- 2) Overview, diagnosis and staging of musculoskeletal tumors
- 3) Radiographic considerations in musculoskeletal tumors
- 4) Benign bone and cartilage lesions
- 5) Soft-tissue lesions, benign
- 6) Chondroid lesions
- 7) Osteoid lesions
- 8) Fibrous lesions
- 9) Cystic lesions
- 10) Synovial lesions

- 11) Others including but not limited to, unicameral bone cyst (UBC), hemangioma, histiocytosis, lipoma, eosinophilic granuloma, giant cell tumor (GCT), aneurysmal bone cyst (ABC), Ewing's sarcoma, adamantinoma, chordoma, hemangiopericytoma, osteoid osteoma, osteoblastoma
- 12) Miscellaneous lesions that mimic cancers
- 13) Malignant lesions of bone and cartilage
- 14) Bone metastasis
- 15) Principles of biopsy

Pediatric surgery

Core Topics:

- 1) Growth and development
 - Malformations, deformations, disruptions, dysplasias
 - Epiphyseal growth and closure
 - Tanner's stages of development
 - Developmental milestones: Gross and fine motor skills, personal, social, and verbal skills
- 2) Pediatric orthopaedic history including birth history
- 3) Pediatric orthopaedic examination
- 4) Gait analysis
 - Muscle activity during stance and swing phases
 - Abnormal patterns of gait: antalgic, Trendelenburg, proximal muscle weakness, spastic gait, short-limb gait
- 5) The limping child: inflammatory and infectious disorders, neurologic disorders, anatomic disorders, neoplasms to consider
- 6) Back pain
- 7) Anesthetic considerations:
 - Preoperative evaluation of children: nothing by mouth, fluid management
 - Sedation
 - Acute pain management and regional anesthesia
 - Latex allergy
 - Malignant hyperthermia
 - Anesthetic considerations for pediatric orthopaedic diseases and syndromes
- 8) Pediatric imaging
- 9) Disorders of the neck
 - Torticollis
 - Cervical kyphosis and lordosis
 - Cervical instability
 - Disorders of the spine: scoliosis, kyphosis, spondylolisthesis, lumbar disc herniation, slipped vertebral apophysis, transitional vertebra (Bertolotti) syndrome
- 10) Developmental dysplasia of hip
- 11) Legg-Calvé-Perthes disease
- 12) Slipped capital femoral epiphysis
- 13) Disorders of the femur: femoral anteversion, snapping iliotibial band syndrome
- 14) Disorders of the knee
 - Congenital hyperextension deformity of the knee, flexion deformity (congenital dislocation of the patella, congenital knee flexion contracture)
 - Overuse conditions
 - Patellofemoral instability

- 15) Disorders of the leg
 - Genu varum: physiologic, tibia vara
 - Genu valgum
 - Tibial torsion
 - Bowing of the tibia (anterolateral, posteromedial)
 - Congenital pseudarthrosis of the fibula
- 16) Disorders of the foot
 - Normal variations: os trigonum, accessory navicular
 - Osteochondroses: Kohler disease, Freiberg infraction
 - Congenital deformities: postural deformities, talipes calcaneovalgus, pes planovalgus, skewfoot, congenital talipes equinovarus, vertical talus, tarsal coalition, cleft foot
 - Neurologic abnormalities: cavus foot
 - Toe deformities: juvenile hallux valgus
- 17) Leg length inequality: etiology and associated conditions, assessment, prediction of leg length inequality in the skeletally immature child, treatment
- 18) Angular deformities
- 19) Acute transient synovitis of the hip
- 20) Infections of the musculoskeletal system: laboratory studies, imaging, microbiology, manifestation, systemic diseases associated with infection: sickle cell disease
- 21) Injuries and trauma
 - General principles: plastic deformation, fractures, remodeling and overgrowth, physeal injuries
 - Care of multiply injured children
 - Compartment syndrome with considerations in pediatrics
 - Child abuse
 - Spinal injuries of the cervical, thoracic, and lumbar spine
 - Upper extremity injuries
 - Lower extremity injuries

Mastery Level Topics:

- 1) Disorders of the upper extremity
 - Timing of surgical procedures
 - Congenital anomalies (classification, associated anomalies, radial and ulnar dysplasia, congenital high scapula, pseudarthrosis of the clavicle, phocomelia, synostosis of the radius and ulna, arthrogryposis in the upper limb, Madelung deformity, polydactyly, syndactyly, thumb abnormalities, macrodactyly, congenital band syndrome, Apert syndrome)
 - Infections: paronychia, felon, pyogenic tenosynovitis, bite wounds, septic arthritis, osteomyelitis, conditions mimicking infection, chronic multifocal osteomyelitis
 - Neonatal brachial plexus palsy
- 2) Teratologic dislocation of the hip
- 3) Congenital coxa vara
- 4) Juvenile idiopathic arthritis: clinical features, laboratory evaluation
- 5) Spondyloarthropathies: juvenile ankylosing spondylitis, Reiter syndrome
- 6) Neuromuscular disorders: disorders of the brain and spinal cord, poliomyelitis, muscle diseases

- 7) Skeletal dysplasias: achondroplasia, hypochondroplasia, dwarfism, pseudoachondroplasia, spondyloepiphyseal dysplasia, multiple epiphyseal dysplasia, chondrodysplasia punctata, osteopetrosis, mucopolysaccharidoses
- 8) Orthopaedic-related syndromes: Down syndrome, neurofibromatosis, arthrogryposis
- 9) Metabolic and endocrine diseases of the bone: rickets: nutritional, rickets of prematurity, drug-induced, vitamin D-resistant, hypophosphatemic, renal osteodystrophy, parathyroid disorders, vitamin disorders, hypophosphatasia and hyperphosphatasia, osteogenesis imperfecta
- 10) Limb deficiencies and congenital absence of limbs
 - Congenital lower limb deficiencies: proximal focal femoral deficiency, fibular deficiency, tibial deficiency, foot deficiency
 - Congenital upper limb deficiencies: transverse deficiencies, radial and ulnar deficiencies

Spine surgery

Core topics:

- 1) History and examination of adult spine
- 2) Approach to low back pain
- 3) Emergencies in the spine (specifically acute cauda equina syndrome, acute neurological deterioration, acute traumatic spinal cord injury)
- 4) Spinal degenerative spondylosis
- 5) Radiculopathy/disc herniation
- 6) Myelopathy
- 7) Cervical spine and rheumatoid arthritis
- 8) Spinal stenosis
- 9) Scoliosis
- 10) Spondylolisthesis
- 11) Systemic conditions (spinal osteomyelitis, metastatic spine tumor, osteoporosis, fractures and dislocations)

Mastery level topics:

- 1) Post-traumatic kyphosis
- 2) Flatback syndrome
- 3) Failed back syndrome
- 4) Pseudarthrosis
- 5) Adjacent segment degeneration
- 6) Postoperative complications

Sports medicine

Core topics:

- 1) Anatomy and histology of the hip, knee, ankle, shoulder, elbow, and wrist
- 2) Arthroscopic portals for the above-mentioned joints
- 3) Biomechanics of the hip, knee, shoulder, elbow, and ankle
- 4) Kinematics of the above-mentioned joints
- 5) Anterior cruciate ligament (ACL) rupture
- 6) Medial collateral ligament (MCL) injuries

- 7) Knee dislocation
- 8) Meniscal pathology
- 9) Knee arthropathy
- 10) Acute shoulder and elbow dislocation
- 11) Patellar chondromalacia
- 12) Patellofemoral maltracking and instability
- 13) Patellar dysplasia
- 14) Extensor tendon rupture
- 15) Bursitis around the knee and hip
- 16) Sports physiology and nutrition
- 17) Cardiac conditions in the athlete
- 18) Diagnosis and basic management of head and spine injuries on the field
- 19) Infectious conditions in the athlete
- 20) Heat exhaustion and heat stroke
- 21) Hydration for the athlete
- 22) Myositis ossificans
- 23) Muscle contusions and hematomas
- 24) Lower limb sagittal, coronal, and rotational malalignment

Mastery level topics:

- 1) Posterior cruciate ligament (PCL) injury (acute and chronic)
- 2) Lateral collateral ligament rupture
- 3) Posterolateral knee instability (acute and chronic)
- 4) Knee osteochondral defects
- 5) Meniscal repair
- 6) Meniscal transplant
- 7) Discoid meniscus
- 8) Patellar tendonitis
- 9) Quadriceps tendonitis
- 10) Femoroacetabular impingement
- 11) Acetabular labral tear
- 12) Hip instability
- 13) Hip arthroscopy
- 14) Chondral injuries of the hip joint
- 15) Strains and sprains around the hip
- 16) Nerve entrapment syndromes around the knee and hip
- 17) Stress fractures of the lower limbs
- 18) PVNS of the hip and knee
- 19) Piriformis syndrome

Upper extremity

Core topics:

- 1) Clinical evaluation of conditions affecting the shoulder, elbow, wrist, and hand including:
 - Osteoarthritis
 - Rheumatoid arthritis
- 2) Rotator cuff pathology

- 3) Shoulder dislocation
- 4) Tendinopathies
- 5) Adhesive capsulitis, stiff shoulder
- 6) Stiff elbow
- 7) Unstable elbow
- 8) Nerve compression syndromes
- 9) Fractures
- 10) Ligament injuries
- 11) Common masses
- 12) Radial/ulnar shaft fractures
- 13) Distal radius fractures
- 14) Ulnar impaction syndrome
- 15) Acute triangular fibrocartilage complex (TFCC) tears
- 16) Osteoarthritis of the wrist
- 17) Intercarpal ligament injuries
- 18) Ganglion cysts
- 19) De Quervain's tenosynovitis.
- 20) Intersection syndrome
- 21) Trigger fingers
- 22) Carpal tunnel syndrome
- 23) Carpal fractures
- 24) Ulnar tunnel syndrome
- 25) Wartenberg's syndrome
- 26) Tendon laceration
- 27) Nerve laceration
- 28) Basal joint arthritis
- 29) Metacarpal/phalangeal fractures
- 30) Mallet finger
- 31) Boutonnière deformity
- 32) Swan neck deformity
- 33) Dupuytren's contracture
- 34) Syndactyly
- 35) Polydactyly
- 36) Proximal humerus fractures
- 37) Humeral shaft fractures
- 38) Distal humeral fractures
- 39) Coronoid fractures
- 40) Radial head fractures
- 41) Olecranon fractures

Mastery level topics:

- 1) Osteoarthritis of the shoulder and acromioclavicular joint: surgical management
- 2) Rotator cuff tears
- 3) Rotator cuff tear arthropathy
- 4) Labral/capsular injuries
- 5) Shoulder instability and dislocations, including multidirectional instability
- 6) Proximal/distal biceps lesions
- 7) Acromioclavicular joint separations
- 8) Failed shoulder/elbow surgery

- 9) Osteoarthritis of the elbow
- 10) Elbow collateral ligament injuries and reconstruction
- 11) Elbow contractures
- 12) Elbow dislocations
- 13) Lateral/medial epicondylitis
- 14) Cubital tunnel syndrome
- 15) Revision total shoulder arthroplasty
- 16) Shoulder fusion
- 17) Resection arthroplasty
- 18) Elbow fusion
- 19) Elbow interposition arthroplasty
- 20) Reverse shoulder arthroplasty
- 21) Resurfacing shoulder replacement
- 22) Arthroscopic principles of rotator cuff repair and superior labral tear from anterior to posterior (SLAP) repair
- 23) Arthroscopic pan-capsular shoulder stabilization
- 24) Arthroscopic shoulder capsular release
- 25) Total elbow arthroplasty
- 26) Arthroscopic elbow osteo-capsular arthroplasty
- 27) Principles of microsurgical techniques
- 28) Advanced fracture fixation methods
- 29) Tendon transfers in the upper limb

Trauma

Core Topics:

- 1) Biology of fracture repair
- 2) Biology of soft-tissue injuries
- 3) Biomechanics of fractures
- 4) Evaluation, treatment, and orthopaedic management decisions in the multiple-trauma patient
- 5) Principles of nonoperative fracture treatment
- 6) Principles of external fixation and internal fixation
- 7) Evaluation and treatment of vascular injuries
- 8) Compartment syndromes
- 9) Fractures with soft-tissue injuries
- 10) Pathologic fractures
- 11) Spine:
 - Initial evaluation and emergency treatment of the spine-injured patient
 - Imaging
 - Management techniques
 - Injuries of the cervicoacranium
 - Lower cervical spine injuries
 - Thoracic and lumbar spine injuries
- 12) Upper extremity trauma
- 13) Lower extremity trauma
- 14) Medical management of the patient with hip fracture
- 15) Amputations in trauma

Mastery Level Topics:

- 1) Fractures in the stiff and osteoporotic spine
- 2) Complications of the treatment of spinal trauma
- 3) Fractures of the pelvis and acetabulum
- 4) Post-traumatic reconstruction of proximal humeral fractures and fracture dislocations
- 5) Reconstructive total hip replacement after proximal femoral injury
- 6) Post-traumatic reconstruction of the foot and ankle
- 7) Principles of deformity correction
- 8) Periprosthetic fractures of the lower extremities

EXPECTED LEVEL OF COMPETENCY FOR CORE SPECIALTY LEVEL PROBLEMS

General orthopaedics

By the end of the residency training in General Orthopaedics, the resident should be able to:

- 1) Determine the appropriate local anesthesia or conscious sedation for the safety and comfort of the patient during emergency room orthopaedic procedures.
- 2) Discuss the necessary elements of the examination of the orthopaedic patient in the outpatient or clinic setting, including the elicitation of an appropriate history, physical examination techniques, imaging studies, and necessary laboratory studies.
- 3) Describe the treatment options (operative and non-operative, where appropriate) available to the patient based on pertinent findings of the patient assessment, be able to explain the advantages and disadvantages of the options to the patient and family, and recommend appropriate care for the patient's condition.
- 4) Understand the short- and long-term outpatient follow-up for patients appropriate to their conditions.
- 5) Understand the limits of his or her own knowledge and of the available facilities for managing orthopaedic patients, and arrange consultation with more experienced or specialized personnel and appropriate facilities as needed.
- 6) Instruct and supervise the junior residents in pursuit of their goals and objectives.
- 7) Instruct and supervise the junior residents in the appropriate techniques for general orthopaedic procedures.
- 8) Demonstrate the ability to effectively manage the responsibilities of on-call duty, including supervision and instruction of the junior residents.
- 9) Demonstrate the assessment and management of orthopaedic injuries and illnesses commonly encountered in the emergency room, including appropriate physical and imaging examinations, recognition of important features of the condition, and the appropriate type of procedure required for initial treatment.
- 10) Demonstrate the manual techniques for initial management of commonly encountered orthopaedic and hand problems in the emergency room (i.e., reduction of fractures and dislocations, treatment of lacerations involving the joint or tendon, examination of soft-tissue injuries to the joint or muscle, and aspiration of the joint or fluid collection).
- 11) Demonstrate appropriate immobilization and dressing techniques for commonly encountered orthopaedic problems.
- 12) Instruct and consult on the evaluation of emergency room patients and oversee the effective triage of patients with injuries or illnesses that are considered to be orthopaedic emergencies (i.e., acute or imminent septic disease, infections, open fractures, compartment syndrome, etc.).
- 13) Demonstrate physical examination techniques appropriate to the patient's chief complaint and history, and arrange further studies as needed.
- 14) Perform a basic interpretation of imaging and laboratory study findings in the context of the patient's history and examination.
- 15) Demonstrate the appropriate preoperative work-up of orthopaedic patients, including the appropriate problem-focused orthopaedic physical examination, functional assessment, and imaging studies.
- 16) Perform an appropriate preoperative screening history and physical examination, and refer the patient for further examinations as needed for preoperative clearance for the procedure in question.

- 17) Participate in the definitive management, including surgical intervention when appropriate, of conditions commonly encountered by the general orthopaedist (i.e., traumatic injuries of the spine and extremities; arthritic conditions involving the spine and extremities; orthopaedic infections; acute and chronic sports injuries involving bone, muscle, ligament, and tendons).
- 18) Evaluate and determine appropriate interventions for the orthopaedic and postoperative issues that arise in the care of postoperative patients (i.e., pain control, bleeding and drainage, fever, traction, and postoperative stabilization).
- 19) Recommend and arrange, as necessary, appropriate postoperative or postprocedure care including pain control, activity status including immobilization and/or therapeutic exercise, wound management, and appropriate nursing or custodial care for orthopaedic patients upon discharge.
- 20) Be punctual for all clinical responsibilities.
- 21) Respect the specific needs of his/her patients based on age, gender, race, and culture in formulating treatment plans.
- 22) Demonstrate respectful collaboration with their peers and allied health staff.
- 23) Demonstrate the ability to elicit the presence and location of physical symptoms with cognitively impaired patients.
- 24) Discuss functional prognosis with the patient and family with attention to their educational, social, and personal beliefs.
- 25) Provide adequate written and verbal communication to peers, allied health professionals, and consultants so that they may continue the plan of care in an effective manner when the resident is absent from the floor or service.
- 26) Act in a consultative role to other physicians and health professionals.
- 27) Maintain comprehensive, timely, and legible medical records.
- 28) Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems.
- 29) Use information technology to optimize learning.
- 30) Analyze practice using quality improvement methods, and implement changes with the goal of practice improvement.
- 31) Demonstrate an understanding of the cost/benefit of prescriptions and tests ordered.
- 32) Justify continued length of stay in an acute care setting based on clinical findings and available benchmark data.
- 33) Follow hospital guidelines when completing all discharge and operating room reports.
- 34) Understand how the healthcare organization affects surgical practice.
- 35) Follow the established practices, procedures, and policies of the department and affiliated hospitals.

Arthroplasty rotation

Junior rotation

By the end of the junior rotation in Arthroplasty, the resident should be able to:

- 1) Based on a careful history and physical exam, propose a rational approach to the evaluation of patients with pain at various intervals after a total hip replacement.
- 2) Demonstrate the ability to elicit the presence and location of physical symptoms with cognitively impaired patients.
- 3) Differentiate the bursal and soft-tissue diseases about the hip/knee and then outline a treatment plan during office sessions, clinic, and rounds.

- 4) Distinguish other diseases predisposing to arthritis (Paget's disease, avascular necrosis, Charcot arthropathy, ochronosis).
- 5) Obtain an accurate history and perform a thorough physical examination on patients with an inflamed hip and knee to generate a differential diagnosis of this condition with the pertinent positive and negative findings of these disorders: rheumatoid arthritis, septic arthritis, acute/chronic osteomyelitis, primary/post-traumatic osteoarthritis, gout, pseudo-gout, systemic lupus erythematosus, Reiter's disease, ankylosing spondylitis, PVNS, hemophilia, and osteonecrosis. The resident must be able to formulate a plan for the work-up of these patients including laboratory and radiographic evaluation.
- 6) Explain preoperative planning of standard total hip/knee replacement.
- 7) Understand the general principles and surgical technique for the cemented/cementless femoral and acetabular components.
- 8) Understand the classification of acetabular and femoral deficiencies.
- 9) Understand the classification of tibial and femoral deficiencies about the total knee arthroplasty (TKA).
- 10) Based on a careful history and physical examination, the resident will be able to formulate an approach to the evaluation of patients with pain at various intervals after a total hip and knee replacement.
- 11) Explain the rationale for implant selection (type, size, and configuration) for primary THA/TKA cases.
- 12) Understand basic biomaterials issues in total joint arthroplasty. Discuss the following materials and their use in orthopaedic implants: ceramics, polyethylene, metals, and methyl methacrylate.
- 13) Understand the perioperative considerations for THA and TKA including preoperative medical evaluation, blood conservation, deep vein thrombosis prophylaxis, and rehabilitation.

Senior rotation

By the end of the senior rotation in Arthroplasty, in addition to obtaining competency in the junior rotation, the resident will:

- 1) Organize and make good judgments and quick decisions.
- 2) Organize a systematic evaluation of disorders including radiography, laboratory tests, and appropriate ancillary studies.
- 3) Based on the information, be able to formulate a differential diagnosis and propose a treatment plan for these disorders: osteoarthritis (primary and secondary), rheumatoid arthritis, seronegative arthritis, septic arthritis, osteomyelitis, PVNS, hemophilic arthropathy, osteonecrosis, and Charcot arthropathy.
- 4) Explain the indications for knee fusion and be familiar with various methods of fusion.
- 5) Distinguish nonsuppurative joint infections (fungal, tuberculosis, viral) and recognize less common forms of secondary osteoarthritis (post-septic, Paget's disease, hemochromatosis).
- 6) Evaluate and propose treatment for patients with anterior knee pain.
- 7) Develop a preoperative plan for revision total hip arthroplasty
- 8) Evaluate patients with painful THAs and make appropriate judgments based on data obtained from ancillary studies. The senior resident will be expected to be able to present the problem, analyze the data, and select a plan of action for these patients.
- 9) Recognize the early complications after THA/TKA and their management.
- 10) Recognize the late complications after THA/TKA and their management.

- 11) Evaluate patients with painful total joint arthroplasty and make appropriate judgments based on history, physical examination, and ancillary studies. The senior resident will be expected to be able to present the problem, analyze the data, and select a plan of action for these patients.
- 12) Discuss the treatment options for infected THA/TKA including two-stage reconstruction.
- 13) Thoroughly comprehend arthroplasty complications and be able to formulate an approach to the treatment (and prevention) of these problems.
- 14) Discuss the management and surgical approach to periprosthetic fractures about the THA and TKA.
- 15) Understand the techniques for the surgical treatment of osteolysis about the primary THA and TKA.
- 16) Understand the immediate and long-term interactions between host bone and implants, bone remodeling, and its implications about the THA (e.g. calcar resorption, cementless stem ingrowth) and TKA.
- 17) Understand the biological responses to wear debris and differentiate them from bone response to implants (osteolysis versus resorption).
- 18) Understand the tribiology (wear issues) associated with total joint arthroplasty.
- 19) Understand the design rationale for THA and TKA implants as it pertains to common complications (PF groove, elevated lip liners, anatomic versus straight stems, etc.).
- 20) Understand the biomechanics of a TKA and osteotomy about the knee.
- 21) Describe the pathogenesis of implant loosening (lysis, membrane formation, enzyme elevation) at the cement-bone and metal-cement interfaces.
- 22) Discuss the principles and biomechanics of osteotomies about the hip/knee.
- 23) Explain the rationale for implant selection (type, size, and configuration) for revision THA/TKA cases and have a thorough understanding of the design rationale for THA and TKA implants.
- 24) Demonstrate a thorough understanding of the use and indications of the primary cementless femoral component, including cementless femoral components (modular), cementless femoral component (extensively coated), hydroxyapatite-coated implants, proximal fixation of the non-cemented stem, and the tapered femoral component.
- 25) Describe the application of allografts for THA/TKA surgery.
- 26) Thoroughly comprehend the principles of THA including: offset, leg length, range of motion, stability, and templating.
- 27) Understand the principles of femoral and pelvic osteotomies and be able to draw accurate preoperative plans for the procedure.
- 28) Summarize the indications for hip/knee arthrodesis and illustrate the techniques commonly used.
- 29) Describe the indications for a resection arthroplasty and synovectomy of the hip.
- 30) Remove complex hardware around the hip and knee.
- 31) Preoperatively plan for a cemented or cementless THA/TKA, and be able to competently perform uncomplicated THA/TKA surgery.
- 32) Perform amputations about the knee pre- and post-arthroplasty.
- 33) Perform various parts of standard revision THA/TKA, complex THA/TKA, and revision of septic THA/TKA procedures.
- 34) Perform femoral allografting (intercalary or interpositional).
- 35) Reduce a dislocated hip and know how to manipulate a hip under anesthesia to determine the stable range of motion.
- 36) Formulate an operative and non-operative plan of action to address the unstable THA.
- 37) Perform a complete synovectomy about the THA/TKA.
- 38) Plan and carry out a successful cemented, hybrid, and cementless standard primary THA.

- 39) Preoperatively plan for complicated THA surgery including THA in the posttraumatic patient, complex primary acetabular replacement, complex primary femoral replacement, and hip fractures treated by arthroplasty.
- 40) Preoperatively plan for complicated TKA surgery including rheumatoid arthritis, flexion contractures, and varus or valgus deformities.
- 41) Perform soft-tissue releases about the knee to correct severe varus/valgus deformities with TKA.
- 42) Have the surgical skill to balance the flexion and extension gaps during TKA.
- 43) Plan for revision THA/TKA (including 2-stage for sepsis) and perform parts of this surgery.
- 44) Plan for and perform parts of revision of the femoral THA component utilizing cemented, uncemented, and extensively coated modular implants with or without bulk allografts and struts and impaction grafting techniques.
- 45) Plan for and perform parts of revision of the acetabulum by cementless acetabular reconstruction, structural grafting, bone packing, and using cement with all-polyethylene components and acetabular cages.
- 46) Plan the approach for excision of heterotopic bone and carry out the procedure.
- 47) Plan for a femoral or pelvic osteotomy and be able to understand the approach and technique of this surgery.
- 48) Perform most of a hip/knee fusion.
- 49) Have developed not only competence in amputation surgery about the knee but also be able to discuss the rationale for amputation at various levels and the prosthetic options for each level.
- 50) Have and select the optimal flap to address soft-tissue problems (e.g. delayed healing, infection) after TKA.
- 51) Understand and be able to perform parts of the removal of failed hip and knee components and retained cement mantel.
- 52) Understand the principles, exposure, and techniques of complex THA/TKA reconstructions.
- 53) Understand the indications and techniques for the adjunct procedures used to treat AVN (e.g. bone graft, vascularized bone graft).
- 54) Know the indications for, and the techniques of, soft-tissue releases and neurectomy about the hip.
- 55) Know the principles and application of using autografts and allografts for the defects associated with THA/TKA.
- 56) State the principles of osteotomy for medial and lateral compartment arthritis.
- 57) Demonstrate competence in planning these cases and demonstrate proficiency in performing distal femoral or upper tibial osteotomies.

Foot and ankle surgery

Junior rotation

By the end of the junior rotation in Foot and Ankle Surgery, the resident should be able to:

- 1) Understand the gross anatomy and histology of the normal foot.
- 2) Understand the kinematics, kinetics, and wear characteristics of adult foot and ankle biomechanics.
- 3) Understand the examination, diagnosis, and evaluation of hallux valgus, hallux rigidus, hallux varus, and metatarsus primus varus.
- 4) Understand and identify the different types of foot and ankle fractures and dislocations.
- 5) Understand and identify stress fractures of the fibula, metatarsals, navicular, and tibia.

- 6) Interpret plain radiographs of the foot and ankle
- 7) Understand infectious and noninfectious inflammatory disorders of the foot and ankle such as bursitis and plantar fasciitis.
- 8) Understand localized entrapment neuropathies such as anterior tarsal tunnel, digital nerve compression, Morton's neuroma, and sural nerve compression.
- 10) Understand the dermatologic and nail disorders of the nail and adjacent soft tissue.
- 11) Understand and identify the different types of forefoot and toe deformities.
- 12) Understand the classification, roentgenographic evaluation, and treatment outline of flatfoot or pes planus
- 13) Understand neuromuscular and neurologic diseases as they apply to the foot and ankle (i.e., CP, CVA, Charcot-Marie-Tooth disease, diabetes mellitus, myelodysplasia, etc.).
- 14) Understand circulatory disturbances such as arterial aneurysm, distal arterial occlusive disease, lymphedema, and thrombosis.
- 15) Understand the principles and complications of rheumatoid foot and ankle.
- 16) Understand gout and periarticular alterations such as calcific deposits, subtalar arthrodesis, metatarsal head resection, and ankle joint arthrodesis.
- 17) Understand hindfoot pathology such as calcaneal spurs, fasciitis, bursitis, Achilles tendonitis, and varus and valgus deformity of the heel.
- 18) Interpret CT scans, SPECT CT, MRI, etc.

Senior rotation

By the end of the senior rotation in Foot and Ankle Surgery, and in addition to obtaining competency in the junior rotation, the resident will:

- 1) Understand the detailed management approaches (both operative and non-operative) of flatfoot or pes planus.
- 2) Understand the treatment of adult clubfoot.
- 3) Understand the etiology and treatment of cavus foot.
- 4) Understand ligament reconstruction of the ankle.
- 5) Understand osteoarthritis around the ankle and foot.
- 6) Understand common tumors of the foot and ankle such as giant cell tumor, fibroma, ganglion cyst, lipoma, etc.
- 7) Understand and perform procedures related to rheumatoid foot and ankle.
- 8) Perform procedures related to the forefoot (i.e., bunionectomy, distal soft-tissue procedure, osteotomies for Hallux valgus correction, removal of interdigital neuroma, hallux interphalangeal fusion with tendon transfer).
- 9) Perform procedures related to the hindfoot (i.e., triple arthrodesis, resection of Haglund's deformity, tarsal tunnel release, plantar fascial stripping, Achilles tendon lengthening/repair).
- 10) Perform procedures related to the ankle such as ankle arthroscopy, repair of osteochondritis dissecans (OCD) of the talus, and ankle fusion.
- 11) Perform amputations (i.e., digital disarticulation, Syme amputation, Lisfranc amputation, Chopart amputation, below-knee amputation, calcaneotomy).
- 12) Perform trauma procedures related to the foot and ankle (i.e., open reduction internal fixation [ORIF] of displaced phalangeal fractures, ORIF of Lisfranc fracture dislocation, ORIF of talar fractures, etc.).

Oncology

Junior rotation

By the end of the junior rotation in Musculoskeletal Oncology, the resident should be able to:

- 1) Understand the natural history, cellular biology, diagnostic imaging modalities utilized in evaluation, biopsy techniques involved in diagnosis and surgical treatment, and surgical options available for the palliative treatment of primary bone and soft-tissue neoplasms, both benign and malignant.
- 2) Know the spectrum of benign and malignant neoplastic disease entities and tumor-like conditions encountered in musculoskeletal oncology
- 3) Know the important aspects of clinical diagnosis used in the evaluation of soft-tissue and bone neoplasms
- 4) Understand the staging systems and classification of surgical procedures utilized by musculoskeletal oncologists
- 5) Understand the management of surgical specimens and the approach to their interpretation through light microscopy, immunohistochemistry, and cytogenetics.
- 6) Know the general principles for using adjuvant treatment modalities (radiation therapy and chemotherapy) and the surgical options available for palliative treatment of metastatic malignancies, including the evaluation and treatment of pending and overt pathologic fractures.
- 7) Understand the psychological aspects of patient management and the techniques for pain management in orthopaedic oncology patients.
- 8) Know the surgical options available for the palliative treatment of malignant metastases to bone including the evaluation and treatment of pending and overt pathologic fractures
- 9) Identify patient position, surgical approach, and pertinent anatomy for each tumor location
- 10) Know general surgical technique for bone and soft-tissue resections and appropriate margin status
- 11) Design and implement the appropriate diagnostic approach to bone and soft-tissue lesions from the initial outpatient-based clinical evaluation of the patient through a utilization of the entire spectrum of diagnostic modalities.
- 12) Synthesize clinical, radiographic, and pathologic diagnostic information into an appropriate differential diagnosis and a final definitive diagnosis for musculoskeletal lesions.
- 13) Assist in planning of fine needle aspiration, true-cut needle biopsy, and open surgical biopsy in the management of soft-tissue sarcoma. Know how and when each method is optimally utilized.
- 14) Plan and assist in performing core needle biopsy of bone lesions with fluoroscopic control and open biopsies of both soft-tissue and bone tumors in the operating room when appropriate to the stage of training.
- 15) Perform surgical procedures for the treatment of benign bone tumors, benign soft-tissue tumors, and metastatic disease.

Senior rotation

By the end of the senior rotation in Musculoskeletal Oncology, and in addition to obtaining competency in the junior rotation, the resident will:

- 1) Know the reconstructive options following treatment of benign bone tumors (i.e. cementation, internal fixation, bone grafting, and the use of graft alternatives).
- 2) Know the reconstructive options used in the treatment of malignant bone tumors (i.e. allograft, autograft, arthrodesis, total joint arthroplasties, and composite arthroplasties).

- 3) Know the reconstructive options utilized following the treatment of malignant soft-tissue tumors (i.e. split-thickness skin grafting, local rotational flaps, and amputation).
- 4) Understand the advantages and disadvantages of limb salvage vs. amputation in the management of bone and soft-tissue tumors.
- 5) Design and implement the appropriate diagnostic approach to bone and soft-tissue lesions from the initial outpatient-based clinical evaluation of the patient through utilization of the entire spectrum of diagnostic modalities.
- 6) Plan and perform optimal biopsy procedures utilizing core needle biopsy of soft-tissue masses as an outpatient-based procedure.
- 7) Plan and perform core needle biopsy of bone lesions with fluoroscopic control and open biopsies of both soft-tissue and bone tumors in the operating room.
- 8) Synthesize clinical, radiographic, and pathologic diagnostic information into an appropriate differential diagnosis and a final definitive diagnosis for musculoskeletal lesions.
- 9) Formulate a specific treatment plan for a wide spectrum of orthopaedic oncology conditions, both benign and malignant, involving bone and soft-tissue tumors and tumor-like conditions.
- 10) Perform surgical procedures for the treatment of benign bone tumors, benign soft-tissue tumors and metastatic disease.

Pediatric orthopaedics

Junior rotation

By the end of the junior rotation in Pediatric Orthopaedics, the resident should be able to:

- 1) Know the appropriate local anesthesia or conscious sedation for the safety and comfort of the pediatric patient during outpatient orthopaedic procedures.
- 2) Understand the special elements of the initial and follow-up examination of the pediatric orthopaedic patient in the outpatient clinic setting, including working with families, the non-verbal child, the child with developmental disabilities, and adolescents.
- 3) Understand normal and abnormal growth and development, including embryology, osseous growth, muscular growth, growth rate, developmental milestones, and timing, especially secondary sexual characteristics.
- 4) Introduction of skeletal dysplasias including defects of tubular bone (achondroplasia, multiple epiphyseal dysplasia, spondyloepiphyseal dysplasia), disorganized cartilage and/or fibrous components (Ollier's disease), and local or regional bone malformations.
- 5) Understand the characteristics, pathogenesis, diagnostic features, and management of constitutional diseases with bone pathology (rickets, mucopolysaccharidosis, calcium/phosphorus disorders), metabolic (rickets, osteomalacia, renal osteodystrophy, hypophosphatemia, parathyroid or thyroid disorders, heavy metal, juvenile osteoporosis, hypervitaminosis, scurvy, infectious hyperostosis), connective tissues (Ehlers-Danlos, Marfan, Down syndrome), and short stature.
- 6) Understand the etiology, embryology, classification, diagnosis, and treatment of genetic disorders, including autosomal dominant, autosomal recessive, sex-linked dominant, sex-linked recessive, chromosomal, and multifactorial disorders. Recognize the diseases that can be identified through amniocentesis.

- 7) Understand the characteristics, pathogenesis, diagnostic features, and management of muscular dystrophies (such as Duchenne, Becker, limb Girdle, hypotonic, myotonic), inflammatory myopathies (polio, spinal muscular atrophies, hereditary motor sensory neuropathies), myelodysplasia, spondyloarthropathies, cervical spine (congenital malformations, hypermobility), and spinal deformities (scoliosis, kyphosis, spondylosis, and spondylolisthesis).
- 8) Understand underlying processes with upper limb (deficiencies and malformations), hip (such as developmental dysplasia of the hip, Perthes disease, idiopathic chondrolysis), leg length discrepancies, lower limb (congenital deficiencies, congenital pseudarthrosis, posteromedial bowing, patellofemoral syndrome, Osgood-Schlatter disease, congenital dislocation or subluxation, clubfoot, congenital vertical talus, postural deformations, polydactyly).
- 9) Understand clinical manifestations and treatment of gait disorders and fractures.
- 10) Understand the characteristics, history, pathogenesis, management, and indications of surgery for trauma.

Senior rotation

By the end of the senior rotation in Pediatric Orthopaedics, and in addition to obtaining competency in the junior rotation, the resident will:

- 1) Understand, recognize, and manage complex skeletal dysplasias.
- 2) Understand the etiology, diagnosis, and treatment of complex hematologic disorders.
- 3) Understand the characteristics, pathogenesis, diagnostic features, and management of complex neuromuscular disorders.
- 4) Recognize and treat, in conjunction with a multidisciplinary team, cerebral palsy, juvenile rheumatoid arthritis, and complex spinal deformities.
- 5) Understand, recognize, and non-operatively and operatively manage complex upper limb, leg length, hip, and lower limb deformities and disorders.
- 6) Understand the clinical manifestations, treatment, and long-term prognosis of complex gait disorders and fractures.
- 7) Understand the characteristics, history, pathogenesis, management, and indications for additional treatment of complex trauma.

Spine surgery

Junior rotation

By the end of the junior rotation in Spine Surgery, the resident should be able to:

- 1) Evaluate the following conditions via a thorough H&P:
 - Cervical
 - Degenerative spondylosis
 - Radiculopathy/disc herniation
 - Myelopathy
 - Rheumatoid arthritis
 - Thoracolumbar
 - Degenerative spondylosis
 - Spinal stenosis
 - Disc herniation/radiculopathy
 - Scoliosis

- Spondylolisthesis
 - Systemic
 - Spinal osteomyelitis
 - Metastatic spine tumor
 - Osteoporosis
 - Fractures and dislocations
- 2) Effectively demonstrate that he/she can competently:
- Obtain a comprehensive history
 - Perform any relevant condition-specific physical examination including specific provocative maneuvers and tests (e.g., Hoffman’s sign, femoral stretch test, etc.)
 - Formulate a differential diagnosis
 - Identify appropriate radiographic imaging studies and discuss the advantages and disadvantages of each study vis-à-vis the suspected diagnosis
 - Perform basic radiographic interpretation of spinal radiographs, CT, and MRI studies
 - Outline the **etiology**, or possible etiologies of the specific condition
 - Outline the **natural history** of the specific condition with and without surgical treatment
 - Describe appropriate **non-operative treatment options** (if they exist)
 - Describe appropriate **operative treatment options** (if they exist)
 - Describe possible **complications** of non-operative and operative treatment
 - Outline the **rehabilitation program** involved in non-operative and operative treatment
- 3) Demonstrate competence in the operating room to:
- Position patients for anterior and posterior procedures
 - Apply Gardner-Wells tongs/Mayfield headrest
 - Prep and drape the operative field
 - Close the surgical wound
 - Apply postoperative dressing
- 4) Perform simple invasive procedures including:
- Initial surgical dissection of the posterior approach to cervical or lumbar spine
 - Iliac crest bone graft harvest
 - Insertion of lumbar pedicle screws excluding scoliosis
- 5) Evaluate and communicate the status of postoperative patients, including:
- Neurologic status
 - Wound status
 - Wound drainage

Senior rotation

By the end of the senior rotation in Spine Surgery, and in addition to obtaining competency in the junior rotation, the resident will:

- 1) Effectively be able to evaluate the following conditions via a thorough history and physical examination:
- Complex deformity
 - Post-traumatic kyphosis
 - Flatback syndrome
 - Failed back syndrome
 - Pseudarthrosis
 - Adjacent segment degeneration
- 2) Demonstrate ability to interpret advanced imaging studies such as MRI/CT myelogram

- 3) Discuss various surgical approaches relevant to spinal disorders and formulate an appropriate surgical plan
- 4) Perform surgical procedures:
 - Halo application
 - Lumbar microdiscectomy
 - Anterior cervical discectomy
 - Lumbar laminectomy
 - or 2-level instrumented lumbar fusion
 - Posterior cervical fusion with lateral mass screws between C3 and C6
- 5) Select appropriate diagnostic and therapeutic interventions for patients with postoperative complications:
 - Postoperative neurologic deficit
 - Epidural hematoma
 - Postoperative wound infection
 - Deep vein thrombosis/pulmonary embolism
 - Dural tear/cerebrospinal fluid fistula

Sports medicine

Junior rotation

By the end of the junior rotation in Sports Medicine, the resident should be able to:

- 1) Perform a physical examination of the shoulder and identify all pertinent anatomic landmarks, quantify range of motion, evaluate glenohumeral stability of the rotator cuff and the acromioclavicular (AC) joint
- 2) Make a clinical diagnosis of the following: adhesive capsulitis, anterior instability, posterior instability, rotator cuff tendinitis, impingement syndrome, AC joint arthrosis, AC joint separation and grade, and biceps rupture.
- 3) Understand physical therapy modalities in general sports medicine
- 4) Understand and describe the pertinent clinical anatomy of the shoulder, elbow, knee, leg, ankle, and foot
- 5) Understand and weigh surgical risks and potential benefits for each patient for each surgical procedure considered.
- 6) Understand and describe the clinical anatomy and biomechanics of the shoulder
- 7) Understand and describe the mechanics of the throwing motion
- 8) Understand and describe the relationship between shoulder instability and rotator cuff tendinitis
- 9) Understand and describe the relationship between impingement and rotator cuff tears.
- 10) Describe the pathophysiology and rationale for non-operative treatment of the following pathologic entities related to the shoulder: rotator cuff tendinitis/tear/impingement, glenohumeral instability, adhesive capsulitis
- 11) Describe the indications and rationale for the following procedures related to the shoulder (describe both open and arthroscopic variations of the procedure, indication for each, and rehabilitation protocol): rotator cuff repair, subacromial decompression, stabilization procedures, Mumford procedure.
- 12) Understand the differential diagnosis and treatment for anterior knee pain and patellar instability.

COMPETENCY FOR CORE SPECIALTY PROBLEMS

- 13) Understand the typical history and presentation of anterior or posterior cruciate ligament injuries
- 14) Be familiar with the various types of knee braces
- 15) Understand the healing potential and current treatment options of meniscal tears and chondral defects.
- 16) Understand the presentation and pathology of meniscal cysts and discoid menisci
- 17) Understand the non-operative treatment of patella tendinitis, saphenous neuritis, and MCL sprains
- 18) Understand the postoperative rehabilitation of meniscal repairs and ACL reconstructions
- 19) Understand the presentation, evaluation and treatment of common postoperative complications of infection and deep venous thrombosis
- 20) Understand and describe the pathophysiology of compartment syndrome
- 21) Understand and describe the pathophysiology of stress fracture
- 22) Be familiar with special radiographic examinations of the leg and thigh including MRI, CT, and nuclear medicine studies
- 23) Discuss the possible etiologies of peroneal nerve injury and recognize the signs of peroneal nerve injury.
- 24) Understand the pathophysiology and presentation of OCD of the talus
- 25) Understand the pertinent clinical anatomy and biomechanics of the ankle.
- 26) Understand the non-operative treatment of the following related to the ankle: Peroneal or posterior tibialis tendinitis, ankle sprains, Achilles tendinitis, ankle instability
- 27) Understand the pathophysiology and presentation of the following related to the ankle: the different types of Achilles tendinitis, the different types of ankle sprains, and ankle instability.
- 28) Understand the presentation and the non-operative treatment of the following related to the elbow: lateral epicondylitis, medial epicondylitis, ulnar collateral ligament sprains, ulnar neuritis, olecranon bursitis, and radial head fractures.
- 29) Understand the pertinent clinical anatomy and biomechanics of the elbow.
- 30) Understand the pathology and presentation of Panner's disease (OCD of capitellum) and valgus extension overload
- 31) Write a physical therapy prescription for the following related to the shoulder: rotator cuff tendinitis/tear/impingement, glenohumeral instability, adhesive capsulitis, rotator cuff repair, subacromial decompression, stabilization procedures, and the Mumford procedure.
- 32) Identify all pertinent anatomic landmarks of the knee and evaluate knee range of motion.
- 33) Make a clinical diagnosis of the following related to the shoulder: labral tear and rotator cuff tear.
- 34) Know the indications for the following procedures related to the shoulder: distal clavicle excision and open decompression.
- 35) Evaluate and grade knee stability in varus/valgus, anterior/posterior, and rotatory directions using appropriate clinical tests
- 36) Make a clinical diagnosis of the following: ACL tear, PCL tear, MCL injury/tear, lateral collateral ligament injury/tear, chondromalacia patella, patella instability, degenerative arthritis, prepatella bursitis, tibial plateau fracture, quadriceps rupture, patellar tendon rupture, knee dislocation.
- 37) Make a clinical diagnosis of the following related to the knee: posterior lateral corner injuries, meniscal tear, loose body, synovitis, plica syndrome, and vastus medialis oblique avulsion
- 38) Diagnose and describe the nonoperative treatment of the following related to the thigh/leg: quadriceps contusion, hamstring strain/tear, quadriceps strain/tear, hip flexor/adductor strain/tear, stress fracture of the femur or tibia, shin splints, and gastrocnemius strain/tear.
- 39) Know the indications for the following procedures related to the knee: diagnostic arthroscopy,

- 40) arthroscopic debridement, partial meniscectomy, abrasion chondroplasty, and patellar tendon repair.
- 41) Diagnose and describe the non-operative treatment of exertional compartment syndrome, medial tibial stress syndrome, and stress and traumatic fractures of the tibia and fibula.
- 42) Diagnose the following related to the leg and thigh: exertional compartment syndrome, medial tibial stress syndrome, shin splints, gastrocnemius strain/tear, and Maisonneuve fracture/syndesmosis injury.
- 43) Know the indications for and be able to perform the following procedures related to the leg/thigh: Compartment releases: Anterior, lateral, and posterior.
- 44) Know the indications for the following procedures related to the elbow: diagnostic arthroscopy, tennis elbow debridement, ORIF fractures, Olecranon bursa debridement/drainage.
- 45) Perform a physical examination of the elbow and identify all pertinent landmarks.
- 46) Evaluate range of motion and stability of the elbow joint.
- 47) Diagnose the following related to the elbow: Lateral epicondylitis, medial epicondylitis, ulnar nerve entrapment, valgus extension overload, ulnar collateral ligament incompetence, biceps tendinitis or distal rupture, OCD of capitellum, and Olecranon bursitis.
- 48) Perform the following procedures related to the elbow: reduction of dislocation, and saline arthrogram.

Senior rotation

By the end of the senior rotation in Sports Medicine, and in addition to obtaining competency in the junior rotation, the resident will:

- 1) Detailed knowledge of the anatomical structures of the shoulder, elbow, knee and ankle as it relates to sports injuries and surgical approaches and reconstructions
- 2) Understand anatomy, physiology, and biomechanics as they relate to patients with sports-related injuries and disease
- 3) Understand the incidence, natural history, cause, historical features, examination findings, classification, non-operative, and operative management of the following key sports-related injuries:
 - Ankle sprains
 - Turf toe
 - Fifth metatarsal fractures
 - Lisfranc injuries
 - Achilles pathology
 - Gastroc strains
 - ACL injuries
 - Meniscal injuries
 - Osteochondral defects and cartilage injuries
 - Patellofemoral pain syndrome
 - Patella dislocations and instability
 - Quadriceps mechanism injuries
 - Hamstring injuries
 - Stress fractures
 - Multiligament injuries
 - AC sprains and injuries
 - Anterior instability

- Multidirectional instability
 - Rotator cuff pathology and tears
 - SLAP tears
 - Throwing injuries
 - Ulnar collateral ligament injuries
 - Distal biceps ruptures
 - Gamekeeper's injury
 - Mallet finger
 - Jersey finger
- 4) Understand the incidence, natural history, cause, historical features, examination findings, classification, and return to play issues with the following sports-related injuries:
- Concussion
 - Cervical spine injuries
 - Stingers
 - Ankle sprains
 - Muscle injuries
 - Stress fractures
- 5) Understand the pre-participation examination and key medical issues in sports medicine:
- Concussion
 - Ocular trauma
 - Asthma
 - Sudden cardiac death
 - Visceral injury
 - Key infections (mononucleosis, HIV, MRSA, herpes)
 - Ergogenic aids
- 6) Be familiar with the various types of knee braces
- 7) Understand the postoperative protocols for various surgeries and the decision to return to full activity.
- 8) Understand the presentation, evaluation, and treatment of common postoperative complications such as arthrofibrosis.
- 9) Take a detailed and appropriate injury-specific history and formulate a differential of pathology, appropriate tests to order, and appropriate indications for surgery.
- 10) Demonstrate a thorough knowledge of the surgery; surgical approach; and the reasoning, biomechanics, placement, and technique of the surgical reconstructions/repair and implants used.
- 11) Interpret and synthesize patient history, clinical examination, and diagnostic tests into coherent diagnoses for each condition
- 12) Perform procedures necessary for the treatment of athletic-associated injuries, with a clear understanding of surgical indications. In particular, the resident should feel confident in their ability to perform the following at the conclusion of their rotation:
- Diagnostic knee arthroscopy
 - Partial meniscectomy
 - Microfracture
 - Graft harvest and preparation for ACL surgery
 - Notchplasty in ACL surgery
 - Creation of bony tunnels for ACL reconstruction
 - Achilles repair, patella tendon, or quadriceps tendon repair
 - Diagnostic shoulder arthroscopy

- Biceps tenotomy
 - Placement of suture anchors in instability or SLAP lesions
 - Passage of suture through the capsule and/or labrum
 - Tying arthroscopic suture knots
 - Subacromial decompression
 - Mumford procedure
 - Placement of suture anchors in rotator cuff tears
- 13) Understand rotator cuff repair suture management
- 14) First assist and anticipate all steps of an arthroscopic rotator cuff repair

Upper extremity rotation

Junior rotation

By the end of the junior rotation in Upper Extremity Surgery, the resident should be able to:

- 1) Demonstrate detailed knowledge of the anatomical structures of the shoulder and know all surgical approaches to the shoulder
- 2) Understand the anatomy, physiology, and biomechanics of the shoulder as they relate to patients with injuries and disease
- 3) Understand the incidence, natural history, cause, presentation, examination findings, classification, and non-operative and operative indications of the following key shoulder conditions:
 - AC sprains, injuries, and conditions
 - Sternoclavicular injuries
 - Anterior instability
 - Posterior instability
 - Multidirectional instability
 - Voluntary instability
 - Rotator cuff pathology and tears
 - Disorders of the biceps tendon
 - Shoulder fractures:
 - Clavicle
 - Distal clavicle
 - Scapula and glenoid
 - Proximal humerus fractures: greater tuberosity, lesser tuberosity, surgical neck, head split, 3-part, 4-part, valgus
 - Impacted 4-part fractures, fracture-dislocation
 - Arthritic conditions of the shoulder:
 - Osteoarthritis
 - Rheumatoid arthritis
 - Avascular necrosis
 - Traumatic arthritis/arthritis of instability
 - Rotator cuff arthropathy
 - Locked dislocations/instability with bone loss
 - Disorders of the scapula
 - Nerve compression disorders about the shoulder
 - Frozen shoulder
 - Calcific tendonitis

- 4) Know the appropriate shoulder radiographs and further imaging studies that should be ordered and evaluated in all of the above conditions.
- 5) Understand the postoperative protocols/decision-making for the postoperative care of rotator cuff, instability, fracture, and shoulder replacement surgeries
- 6) Understand the presentation, evaluation, and treatment of common postoperative complications such as arthrofibrosis, recurrent instability, and re-tear of the rotator cuff.
- 7) Take a detailed and appropriate injury-specific history, formulate a differential of pathology, order appropriate tests, and present the case to the attending.
- 8) Have a thorough knowledge of the surgery; surgical approach; and the reasoning, biomechanics, placement, and technique of the surgical reconstructions/repair and implants used.
- 9) Interpret and synthesize patient history, clinical examination, and diagnostic tests into coherent diagnoses for each condition
- 10) Appropriately position the patient for surgery
- 11) Understand and perform closed reduction of an anterior or posterior shoulder dislocation
- 12) Understand the anatomy/pathoanatomy of why and how to appropriately reduce a displaced proximal humerus fracture
- 13) In particular, feel confident in their ability to perform the following at the conclusion of their rotation:
 - Gain entry to the joint
 - Establish the anterior portal
 - Probe all structures
 - Appropriately place the scope in the subacromial space
 - Understand suture management in rotator cuff and instability surgery
 - First assist and anticipate all steps of an arthroscopic rotator cuff repair/instability surgery
 - Understand the approaches to open shoulder surgery and when to use each
 - Know the appropriate retractors and when to use each for open shoulder surgery
 - Understand/anticipate and know how to assist in fracture fixation, humeral head replacement, total shoulder arthroscopy
 - Understand the steps to expose the glenoid and know how to retract/assist in this aspect
 - Understand the steps, concepts, and approaches to bone loss instability
 - Expose, reduce with assistance, and plate a clavicle fracture

Senior rotation

By the end of the senior rotation in Upper Extremity Surgery, and in addition to obtaining competency in the junior rotation, the resident will:

- 1) Discuss non-operative treatment options for all of the above-listed shoulder conditions.
- 2) Know the reconstructive options used in the treatment of AC instability, anterior/posterior/multidirectional instability, rotator cuff tears, and biceps pathology.
- 3) Understand the influence of bone loss in instability cases and how it affects surgical decision-making.
- 4) Know the fixation options and be able to discuss the reasoning for how to treat fractures of the proximal humerus, clavicle, distal clavicle, glenoid, and scapula.
- 5) Know the reconstructive options that are available for the treatment of shoulder arthritis, as well as cuff arthropathy, and understand the different indications for total shoulder arthroplasty, humeral head replacement, and reverse total shoulder arthroplasty.

- 6) Understand and be able to discuss the thought process and work-up for the treatment of more complex shoulder problems, in particular revision shoulder surgeries and failed surgery with complications.
- 7) Perform a diagnostic shoulder arthroscopy
- 8) Perform a biceps tenotomy
- 9) Perform a deltopectoral approach down to the subscapularis
- 10) Perform a subacromial decompression
- 11) Takedown of the subscapularis
- 12) Perform a distal clavicle resection (Mumford procedure)
- 13) Place suture anchors in instability or SLAP lesions
- 14) Passage of suture through the capsule and/or labrum
- 15) Tie arthroscopic suture knots
- 16) Place suture anchors in rotator cuff tears
- 17) Understand rotator cuff repair suture management
- 18) First assist and anticipate all steps of an arthroscopic rotator cuff repair
- 19) Pass suture through the rotator cuff arthroscopically
- 20) Perform the osteotomy and placement of the humeral component in a TSA
- 21) Understand and know how to perform the releases to expose the glenoid
- 22) Perform the reduction maneuver and plating of proximal humerus and clavicle fractures
- 23) Understand tuberosity reconstruction in a 4-part proximal humerus fracture

Trauma

Junior rotation

By the end of the junior rotation in Orthopaedic Trauma, the resident should be able to:

- 1) Understand the diagnosis and management of orthopaedic trauma and related disorders.
- 2) Understand and develop a systematic approach to the evaluation of trauma patients in all areas of the hospital, including the emergency department, in-patient wards, and clinic.
- 3) Develop the proper thought processes in regard to order of care of the multiply injured patient.
- 4) Understand the pathoanatomy of long bone fractures including recognition of associated injuries, classification of fractures, and temporary stabilization.
- 5) Classify and correctly work up periarticular injuries including pilon, plateau, distal femur, distal radius, elbow, and shoulder fractures.
- 6) Classify and correctly work up pelvis and acetabular injuries.
- 7) Understand the decision to advance from splint stabilization to operative stabilization via external fixator for periarticular injuries.
- 8) Understand the treatment methods for major joint dislocations, including when to order adjunctive tests including angiograms.
- 9) Recognize orthopaedic surgical emergencies.
- 10) Manage patients on the orthopaedic trauma service under the direction of the senior resident or consultant.
- 11) Effectively communicate the orthopaedic needs of patients to consulting services.
- 12) Coordinate the care of patients with consulting services.
- 13) Evaluate traumatic fractures, dislocations, and injuries in the emergency department.
- 14) Demonstrate effective patient management skills in both the inpatient and outpatient settings.
- 15) Demonstrate appropriate management of major joint dislocations.

- 16) Demonstrate appropriate reduction techniques for basic fractures, including distal radius, forearm, humerus, tibial shaft, ankle, and foot fractures.
- 17) Apply proper splinting techniques for fractures.
- 18) Advance understanding of appropriate patient positioning and operating room setup.
- 19) Advance basic surgical techniques, including suturing and wound management.
- 20) Advance skill in the treatment of basic fractures including antegrade femoral and tibial nailing; retrograde femoral nailing; ORIF of the distal radius, both bone forearm, and ankle fractures
- 21) Understand and apply proper techniques in the placement of external fixators that span the knee and ankle.

Senior rotation

By the end of the senior rotation in Orthopaedic Trauma, and in addition to obtaining competency in the junior rotation, the resident will:

- 1) Know the pathoanatomy of most skeletal injuries, i.e. fractures and dislocations of the shoulder, arm, elbow, forearm, wrist, pelvis, acetabulum, femur, knee, ankle, and foot.
- 2) Know the classification of most skeletal injuries i.e. fractures and dislocations of the shoulder, arm, elbow, forearm, wrist, pelvis, acetabulum, femur, knee, ankle, and foot.
- 3) Understand the priorities for initial management, triage, and initial stabilization of skeletal injuries in the multiply injured patient.
- 4) Know the indications for various methods of operative and non-operative treatment of various injuries and learn to use clinical data to select a treatment method.
- 5) Know the complications of each injury.
- 6) Understand the postoperative management of trauma patients.
- 7) Discuss the treatment options, prioritize, and initially stabilize musculoskeletal trauma.
- 8) Become competent in the definitive management of basic fractures, i.e. long bone shaft fractures, hip fractures, ankle fractures, and fractures of the distal radius.
- 9) Demonstrate advancing competence in the management of pelvis, acetabulum, and peri-articular fractures.
- 10) Show advanced knowledge in the use of external fixation for definitive and temporary stabilization.
- 11) Be responsible for the surgical management of the orthopaedic trauma patient when on call.
- 12) Demonstrate the ability to coordinate the care of a musculoskeletal trauma service.

Competencies

CanMEDS Specific Training Level Objectives Guide (R1, R2, R3)

MEDICAL EXPERT	<ol style="list-style-type: none"> 1) Demonstrate the ability to perform a consultation, integrating all of the CanMEDS roles to provide optimal, ethical, and patient-centered medical care. 2) Establish and maintain clinical knowledge, skills, and attitudes appropriate for surgical practice. 3) Perform a complete and appropriate assessment of a surgical patient. 4) Use preventive and therapeutic interventions effectively. 5) Demonstrate proficient and appropriate use of procedural skills.
COMMUNICATOR	<ol style="list-style-type: none"> 1) Develop rapport, trust, and ethical therapeutic relationships with patients and families. 2) Accurately elicit and synthesize relevant information/ perspectives from patients and families, colleagues, and other professionals. 3) Convey relevant information/ explanations accurately to patients and families, colleagues, and other professionals. 4) Develop a common understanding of issues, problems, and plans with patients, families, and other professionals, to construct a shared plan of care. 5) Convey effective oral and written information about medical encounter.
COLLABORATOR	<ol style="list-style-type: none"> 1) Participate effectively and appropriately in interprofessional and interdisciplinary healthcare team. 2) Work with other health professionals effectively to prevent, negotiate, and resolve conflict.
MANAGER	<ol style="list-style-type: none"> 1) Demonstrate an understanding of the influences that affect the functioning of the healthcare system at various levels. 2) Participate in activities that contribute to the effectiveness of healthcare organizations and systems. 3) Manage a practice and career effectively. 4) Allocate finite healthcare resources appropriately.
HEALTH ADVOCATE	<ol style="list-style-type: none"> 1) Respond to individual patient health needs and issues as part of patient care. 2) Describe and respond to the health needs of the communities served. 3) Promote the health of individual patients, communities, and populations. 4) Promote and participate in patient safety.
SCHOLAR	<ol style="list-style-type: none"> 1) Maintain and enhance professional activities through ongoing learning. 2) Critically evaluate medical information and its sources, and apply it appropriately to practice decisions. 3) Facilitate the learning of patients, families, students, residents, other health professionals, the public, and others. 4) Demonstrate a 5) understanding of the principles of dissemination of new knowledge. 5) Demonstrate an understanding of the use of information technology to enhance surgical practice.
PROFESSIONAL	<ol style="list-style-type: none"> 1) Demonstrate a 2) commitment to patients, the profession, and society through ethical practice. 3) Demonstrate a commitment to patients, the profession, and society through participation in profession-led regulation. 4) Demonstrate a commitment to physician health and sustainable practice

COMPETENCY FOR CORE SPECIALTY PROBLEMS

CanMEDS Specific Training Level Objectives Guide (R4, R5)

GENERAL	<ol style="list-style-type: none"> 1) Residents are expected to be competent specialists in orthopaedic surgery, capable of assuming the role of consultants in the specialty. 2) Residents must acquire working knowledge of the theoretical basis of the specialty, including its foundations in basic medical sciences and related research. 3) Orthopaedic residents must understand the normal function and pathological processes and diseases that affect the musculoskeletal system. 4) This includes an understanding, appropriate to the practice of orthopaedic surgery, of normal development and embryology, biochemistry and pharmacology, physiology, anatomy, and gross and microscopic pathology of the musculoskeletal system.
MEDICAL EXPERT	<ol style="list-style-type: none"> 1) Function effectively as orthopaedic residents with increasing levels of responsibility according to year of training. Integrate all of the CanMEDS roles to provide optimal, ethical, and patient-centered medical care Establish and maintain clinical knowledge, skills, and attitudes appropriate to orthopaedic surgery. Perform a complete and appropriate assessment of a patient. 2) Use preventive and therapeutic interventions effectively. 3) Appropriately use and interpret diagnostic tests relevant to orthopaedic surgery. 4) Demonstrate proficient and appropriate use of procedural skills. 5) Recognize the limits of their expertise and seek appropriate consultation from other health professionals
COMMUNICATOR	<ol style="list-style-type: none"> 1) Develop rapport, trust, and ethical therapeutic relationships with patients and families. 2) Accurately elicit and synthesize relevant information and perspectives of patients and families, colleagues, and other professionals. 3) Convey relevant information and explanations accurately to patients and families, colleagues, and other professionals. 4) Develop a common understanding of issues, problems, and plans with patients, families, and other professionals to develop a shared plan of care. 5) Convey effective oral and written information about a medical encounter.
COLLABORATOR	<ol style="list-style-type: none"> 1) Participate effectively and appropriately in an interprofessional healthcare team. 2) Work with other health professionals effectively to prevent, negotiate, and resolve interprofessional conflict.
MANAGER	<ol style="list-style-type: none"> 1) Participate in activities that contribute to the effectiveness of healthcare organizations and systems effectively. 2) Allocate finite healthcare resources appropriately. 3) Serve in administrative and leadership roles.
HEALTH ADVOCATE	<ol style="list-style-type: none"> 1) Respond to individual patient health needs and issues as part of patient care. 2) Identify determinants of health for the populations and communities served. 3) Promote the health of individual patients, communities, and populations

COMPETENCY FOR CORE SPECIALTY PROBLEMS

SCHOLAR	<ol style="list-style-type: none">1) Maintain and enhance2) professional activities through ongoing learning.3) Critically evaluate medical information and its sources, and apply it appropriately to practice decisions.4) Facilitate the learning of patients, families, students, residents, other health professionals, the public, and others.5) Contribute to the development, dissemination, and translation of new knowledge and practices.6) Complete at least one research project under the mentorship of a consultant orthopaedic surgeon, present the project at either a national or an international scientific event, and encourage its publication in a peer-reviewed journal.
PROFESSIONAL	<ol style="list-style-type: none">1) Demonstrate a commitment to patients, the profession, and society through ethical practice.2) Demonstrate a commitment to patients, the profession, and society through participation in profession-led regulation.3) Demonstrate a commitment to physician health and sustainable practice

Appendix

Resident's logbook

Procedures List

- 1) **Category I: Assumed competency**
 - Peripheral venous access
 - Central venous access
 - Arterial blood sampling
 - Various suturing techniques for cutaneous closure
 - Urinary tract catheterization
 - Local anesthetic administration
 - Nasogastric tube insertion
 - Removal of sutures and staples
 - Maintenance of a sterile field
 - Appropriate scrubbing and gowning
 - Incision and drainage of superficial abscess
 - Sterile and contaminated wound dressing

COMPETENCY FOR CORE SPECIALTY PROBLEMS

2) **Category II: Core procedures. Expected completion for Category II procedures should be during R1, R2, and R3**

Procedure	Suggested number required to achieve competency	Number of procedures		Declaration of competency	Supervisor's certification
		Observed	Participated		
Diagnostic and therapeutic joint aspiration or injection:					
Knee	3				
Ankle	3				
Shoulder	3				
Hematoma block	3				
Closed reduction joint dislocation:					
Shoulder	3				
Elbow	3				
Wrist	3				
Hip	3				
Knee	3				
Ankle	3				
Initial management of fractures with appropriate reduction and splinting:					
Cervical spine collar application	3				
Phalangeal fracture closed reduction, splinting	3				
Metacarpal fracture closed reduction, splinting	3				
Distal radius fracture closed reduction, splinting	3				
Forearm fracture closed reduction, splinting	3				
Humerus fracture closed reduction, splinting, functional brace application	3				
Toe fracture closed reduction, splinting	3				
Metatarsal fracture closed reduction, splinting	3				
Lisfranc fracture initial management, splinting	3				
Calcaneus fracture initial management, splinting	3				
Talus fracture initial management, splinting	3				

COMPETENCY FOR CORE SPECIALTY PROBLEMS

Bimalleolar fracture closed reduction, splinting	3				
Fibular fracture splinting	3				
Plafond fracture splinting, initial management	3				
Tibia and fibula fracture closed reduction, initial management	3				
Tibial plateau fracture splinting	3				
Patella fracture splinting	3				
Patella tendon rupture identification, splinting	3				
Femoral condylar fracture splinting	3				
Femoral shaft fracture management, traction	3				
Trochanteric fracture traction	3				
Femur neck fracture traction	3				
Open-book pelvic fracture splinting	3				
Lumbar spine fracture precautions and initial management	3				
Apply skin traction	2				
Apply skeletal traction	3				
Calcaneus	3				
Proximal tibia	3				
Distal femur	3				
Perform technical skills involved in the Advanced Trauma Life Support (ATLS) protocol as outlined in the most current ATLS manual					
Chest tube insertion	3				
Tension pneumothorax decompression	3				
Endotracheal intubation	3				
Measure intra-compartmental pressure					
Leg	3				
Thigh	3				
Forearm	3				
Arm	3				
Perform techniques of fracture fixation and soft-tissue management including open fractures					
Irrigation and debridement in the emergency room	2				

COMPETENCY FOR CORE SPECIALTY PROBLEMS

Irrigation and debridement in the operating room	2				
Perform percutaneous pinning of fractures					
Distal radius fracture	5				
Supracondylar fracture	5				
Proximal humerus fracture	5				
Apply a Pavlik harness	3				
Ponseti casting method	3				

Residents must maintain a logbook

3) Category III: Mastery level procedures. Trainees are expected to be competent by the end of R5

Procedure	Suggested number required to achieve competency	Number of procedures		Declaration of competency	Supervisor's certification
		Observed	Participated		
Musculoskeletal Oncology					
Open biopsy of bone and/or soft-tissue lesion	3				
Stabilization of metastatic disease	5				
Treatment of common benign tumors	5				
Sports Medicine					
Diagnostic arthroscopy of the shoulder	5				
Diagnostic arthroscopy of the knee	5				
Repair of simple and complex tendon ruptures	5				
Anterior cruciate ligament reconstruction	10				
Ankle ligament reconstruction	5				
Patella realignment	5				
Lower extremity realignment	5				
Shoulder reconstruction for instability	5				
Arthroplasty					
Arthrotomy of the hip joint	5				
Arthrotomy of the knee joint	3				
Primary total hip replacement	10				
Primary total knee replacement	10				

COMPETENCY FOR CORE SPECIALTY PROBLEMS

Trauma					
Fasciotomy for compartment syndrome of the leg	3				
Fasciotomy for compartment syndrome of the forearm	3				
Intramedullary nailing of the femur	5				
Intramedullary nailing of the tibia	5				
Intramedullary nailing of the humerus	5				
ORIF, humerus shaft	5				
ORIF, distal humerus	10				
ORIF, both bone fracture of the forearm	5				
ORIF, distal radius	5				
ORIF, scaphoid fracture	5				
ORIF, metacarpal fracture	3				
ORIF, phalangeal fracture	3				
ORIF, femur neck fracture	5				
ORIF, trochanteric hip fracture	3				
ORIF, distal femur fracture	5				
ORIF, patella	3				
ORIF, proximal tibia	10				
ORIF, distal tibia	10				
ORIF, bimalleolar ankle fracture	5				
ORIF, calcaneus fracture	10				
ORIF, talus fracture	10				
ORIF, Lisfranc fracture	5				
ORIF, metatarsal fracture	3				
ORIF, phalangeal fracture	3				
External fixation for pelvis and distal radius fractures	4				
Closed reduction of knee dislocations	3				
Pediatric Orthopaedics					
Percutaneous pinning of fractures	5				
Biopsy for suspected pediatric neoplasia	3				
Arthrogram and arthrotomy of the hip joint	5				
Operative management of osteomyelitis	3				
Stabilization and in situ pinning of slipped capital femoral epiphysis (SCFE)	3				

COMPETENCY FOR CORE SPECIALTY PROBLEMS

Manage complex pediatric fractures including physeal injuries	5				
ORIF, supracondylar fracture	4				
ORIF, capitulum fracture	5				
Single event multi-level surgery (SEMLS)	5				
Spine Surgery					
Patient positioning, prepping, and draping for anterior and posterior spine surgery	3				
Application of external fixation devices (tongs, halos)	3				
Bone graft harvesting techniques	3				
Posterior spinal approaches	3				
Primary lumbar discectomy	5				
Primary cervical, thoracic, or lumbar laminectomy for decompression	5				
Performing a primary posterior instrumented lumbar fusion	10				
Cervical spine reduction techniques	10				
Upper Extremity					
Management of periprosthetic fractures	10				
Surgical management of scaphoid non-union	5				
Corrective osteotomy of the distal radius	5				
Primary shoulder hemiarthroplasty	5				
Radial head arthroplasty	5				
Interpositional carpometacarpal arthroplasty	5				
Interpositional arthroplasty of distal radioulnar joint	5				
Removal of an infected prosthesis	5				
Arthroscopy of shoulder	3				
Arthroscopy of elbow	3				
Arthroscopic loose body removal	5				
Amputation:					
Toe	3				
Midfoot	3				
Symes	5				

COMPETENCY FOR CORE SPECIALTY PROBLEMS

Below-knee	5				
Above-knee	5				
Hip disarticulation	8				
Adhesive capsulitis release	5				
Arthrodesis of the wrist	3				
Open shoulder stabilization	5				
Arthroscopic shoulder stabilization	5				
Acromioclavicular instability	5				
Stabilization of the elbow	3				
Open rotator cuff repair	3				
Arthroscopic rotator cuff repair					
Distal biceps repair					
Extensor pollicis longus rupture reconstruction					
Foot and Ankle					
Forefoot reconstruction for hallux valgus	5				
Management of foot and ankle fractures	3				
First metatarsophalangeal joint arthrodesis	3				
Subtalar joint fusion	5				
Ankle joint fusion	5				
Ankle arthroscopy	5				
Evans calcaneal osteotomy	4				
Calcaneal slide osteotomy	10				
Tibialis posterior tendon reconstruction					
Achilles tendon lengthening	10				
Gastrocnemius slide	5				

For Category II and III procedures, the following must be specified:

- 1) Each trainee must declare that he/she is competent in Category I procedures. If for any reason, a trainee is not competent in any given Category I procedures, he/she should be provided with supervised training.
- 2) Number of procedures observed/participated in, performed under supervision, and certified by the supervisor, in order to be competent.
- 3) The trainee must also declare that he/she is competent to perform the procedure independently.
- 4) Each trainee must maintain a logbook documenting the procedures observed, performed under supervision, and performed independently.
- 5) It would be prudent to determine the minimum number of procedures to be performed before being certified as competent and the minimum number needed to maintain competency.

LEARNING OPPORTUNITIES

Our objective is to optimize educational experience, with mentored rotation in all subspecialties, and offering orthopaedic surgeons opportunities to benefit from a unique combination of resources. Excellence in patient care, research, and education is the overall goal of the orthopaedics residency program. We believe that an orthopaedic residency program should provide its trainees with opportunities to acquire basic knowledge, evaluate basic orthopaedic clinical problems, and demonstrate ethical behavior.

Mission

- High-quality surgical and medical care
- Advances in orthopaedics research
- Excellent training and education
- Serving our community

Universal topics

These topics will be delivered through eLearning and accredited by the Saudi Commission of Health Specialties. They are of value, and shared by other healthcare practitioner, to ensure better quality of care.

Year of Training	Universal Topics
1st Year	Safe drug prescribing Antibiotics stewardship Blood transfusion
2nd Year	Management of acute chest pain Management of acute breathless Preoperative assessment Postoperative assessment Acute pain management Chronic pain management Management of electrolyte imbalance
3rd and 4th year	Care of the elderly Role of doctors in death and dying Ethical issues: treatment refusal, patient autonomy Occupational hazards of HCW Patient advocacy

For the continuous assessment of these universal topics, they could be added to the requirements for examination applications or added to the annual exam.

Examples of weekly activities

Weekly educational activities should be divided into Hospital-based and Saudi Commission of Health Specialty-based. Educational activities in the form of formal lectures and case discussions prepared and presented by residents, faculty, and visiting instructors, occur for a minimum of 6 hours per week through mandatory conferences. This comprehensive curriculum reinforces clinical instruction and covers the broad range of topics needed to prepare for board examinations. Additional teaching is provided through monthly journal clubs, morbidity and mortality case conferences, and grand rounds lectures, each typically presented on a monthly basis. Additionally, residents attend national and regional topical and review courses with support from the program.

Great emphasis is placed on hospital-based activities, which will serve as the cornerstone of residents' continuing education. Hospital-based educational conferences for residents take place at all affiliated hospitals on an almost daily basis, including grand rounds, teaching conferences, fracture conferences, and journal clubs.

Teaching conference

Teaching conference topics follow a resident education curriculum, which, over the course of the academic year, cover all topics of orthopaedic importance. The faculty of the Department of Orthopaedics supervises these sessions.

Fracture conference

Fracture conference occurs twice per month. The format of this conference is largely case presentations by consultants and residents.

Journal club

Journal club centers on a subspecialty subject each month, using an article from a well-respected journal such as JBJS and AAOS. Articles from related subspecialty journals are reviewed. The conference is moderated by the selected subspecialty attending.

Imaging conference

A monthly conference provides the residents with a unique clinical exposure to the tools of radiology and their usefulness in the diagnosis of orthopaedic pathology.

Preoperative and postoperative conferences

Usually held at the end of the week, in this conference, recent cases are selected and presented by the resident who was involved with the patient.

Tumor conference or sarcoma board

The format is recent case presentations including diagnostic and pathological studies. Open discussion is encouraged. One topic receives special emphasis each month, and appropriate readings are assigned in advance.

SCFHS plays a major role in funding and supervising resident educational activities. All residents are released from patient care responsibilities to attend half-day academic activities. Our proposal is to divide the weekly academic activities, with 40 percent dedicated to case presentation and lectures to be held independently in each of the affiliated hospitals following a solid curriculum provided at the beginning of the academic year, and 60 percent to be organized through SCHS, which includes interactive hands-on surgical skills and conferences.

Basic Science Course

The basic science course covers all the appropriate basic science topics. The course provides residents with a strong background in orthopaedic basic science.

An excellent example is the Basic Orthopaedics Course held annually by King Faisal Specialist Hospital and Research Center, which can be enrolled in orthopaedics curriculum for junior residents.

Surgical skills training

The most important addition to the orthopaedics curriculum is hands-on surgical training. Various workshops on different orthopaedic surgical techniques will be provided to all residents through their training, for example: operative procedure for joint replacement, spinal instrumentation, casting techniques, and arthroscopic instrumentation.

Journal subscriptions to top orthopaedic journals

Providing the proper learning tools is of great importance, as it gives the resident a chance to be updated. Not only do they affect how doctors treat patients, they also influence how we think about and approach different orthopaedic problems

Top orthopaedics journals include but are not limited to:

- JBJS – American
- JBJS – British
- JAAOS – Yellow Journal
- Journal of Sports Medicine
- JPO – American
- JPO – British

Core topics

Various important topics were selected to incorporate into academic activities, including common pathology encountered in our community and important subjects for orthopaedic surgeons.

Specialty	Subject
Trauma	Tibial plateau fractures
	Knee dislocation
	Femoral neck fracture
	Compartment syndrome (approach)
	Tibial plafond
	Amputation (surgical technique)
	Pelvis fracture and poly-trauma patient
	Acetabulum fracture
	Proximal humerus fracture
	Humerus fractures
Arthroplasty	Osteonecrosis of the hip
	Adult dysplasia of the hip
	Total hip complications including periprosthetic fractures
	Total knee replacement complications and approach
	Total knee principles, balancing, and alignment
	Types of implants and decision making
Upper extremity	Principles of revision of total hip
	Peripheral nerve entrapment syndromes
	Common distal radial ulnar joint problems
	Kienbock's disease
	Scaphoid nonunion/SNAC /SLAC
	Elbow dislocation and instability
	Common soft tissue injuries/tendinopathy
Sport	ACL and meniscal pathology
	MCL and LCL
	Rotator cuff tears and arthropathy

LEARNING OPPORTUNITIES

Specialty	Subject
	SLAP, GIRD, and Bankart lesion
	Shoulder dislocation including multidirectional instability
	PCL and posterolateral corner injury
	Distal biceps avulsion
	Patellar instability
	Osteochondritis dissecans (knee and ankle)
Pediatric	Supracondylar, medial and lateral condyle fractures
	Slipped capital femoral epiphysis
	Developmental dysplasia of the hip
	Club foot
	Osteomyelitis
	Septic arthritis and transient synovitis
	Tarsal coalition
	Blount disease
	Congenital vertical talus
	Legg-Calvé-Perthes disease
	Distal femur and patellar sleeve fracture
	Both bone forearm fracture
Leg length discrepancy	
Spine	Cervical spondylosis
	Spinal cord injury, complete and incomplete
	Thoracolumbar fracture
	Degenerative disc disease
	Idiopathic scoliosis
	Congenital and neuromuscular scoliosis
	Approach to spinal lesion
	Cauda equina
	Adult spinal deformity
Atlas and axis fractures and cervical trauma	

ASSESSMENT

Evaluations and assessments throughout the program are conducted in accordance with the Commission's training and examination rules and regulations. The process includes the following steps.

Annual assessment

This assessment is conducted toward the end of each training rotation throughout the academic year and at the end of each academic year as a continuous assessment in the form of a formative and summative evaluation and end of year written examination.

Formative Continuous Evaluation

To fulfill the CanMEDS competencies based on the end-of-rotation evaluation, the resident's performance will be jointly evaluated by relevant staff for the following competencies:

1. Performance of the trainee during daily work.
 2. Performance and participation in academic activities.
 3. Performance in a 10- to 20-min direct observational assessment of trainee–patient interactions. Trainers are encouraged to perform at least one assessment per clinical rotation, preferably near the end of the rotation. Trainers should provide timely and specific feedback to the trainee after each assessment of a trainee–patient encounter.
 4. Performance of diagnostic and therapeutic procedural skills by the trainee. Timely and specific feedback for the trainee after each procedure is mandatory.
 5. The CanMEDS-based competencies end-of-rotation evaluation form must be completed within 2 weeks after the end of each rotation (preferably in electronic format) and signed by at least two consultants. The program director will discuss the evaluation with the resident, as necessary. The evaluation form will be submitted to the Regional Training Supervisory Committee of the SCFHS within 4 weeks after the end of the rotation.
 6. The assessment tools used, can be in the form of an educational portfolio (i.e., monthly evaluation, rotational Mini-CEX*, long case assessment CBDs, ** DOPS, *** and MSF****).
 7. Academic and clinical assignments should be documented on an annual basis using the electronic logbook (when applicable). Evaluations will be based on accomplishment of the minimum requirements for the procedures and clinical skills, as determined by the program.
- *Clinical evaluation exercises
 - **Case-based discussions
 - ***Direct observation of practical skills
 - ****Multisource feedback

Summative Evaluation

Annual Report

This is a summative continuous evaluation report (Annual Report) prepared for each resident at the end of each academic year. The report may also involve the result of clinical examination, oral examination, objective structured clinical examination (OSCE), and international in training evaluation exam.

End-of-Year Examination

The end-of-year examination will be limited to R1, R2, R3, R4 and R5 . The number of exam items, eligibility, and passing score will be in accordance with the Commission's training and examination rules and regulations. Examination details and blueprints are posted on the commission website: www.scfhs.org.sa

Part I Saudi Board Orthopaedic Surgery Examination

This is a written examination conducted in multiple choice question formats, is held at least once a year. The examination will focus on applied basic science knowledge related to the orthopaedic such as applied anatomy, physiology, biochemistry, surgical pathology, immunology, pharmacology, and the principles of surgery. The number of exam items, eligibility, and passing score will be in accordance with the Commission's training and examination rules and regulations. Examination details and blueprints are published on the commission website: www.scfhs.org.sa

Final In-training Evaluation Report (FITER)/Comprehensive Competency Report (CCR)

In addition to approval of the completion of clinical requirements (resident's logbook) by the local supervising committee, FITER is also prepared by program directors for each resident at the end of his or her final year in residency (R5). This report may also involve clinical examinations, oral examinations, or other academic assignments.

Final Orthopaedic Surgery Saudi Board Examination (Part II)

The final Saudi Board Examination comprises of two parts, a written examination and a clinical examination.

Written Examination

This examination assesses the trainee's theoretical knowledge base (including recent advances) and problem-solving capabilities with regard to the specialty of Orthopaedic Surgery. It is delivered in

multiple choice question formats and held at least once a year. The number of exam items, exam format, eligibility, and passing score will be in accordance with the Commission's training and examination rules and regulations. Examination details and blueprints are published on the commission website: www.scfhs.org.sa

Clinical / Oral Examination

This examination assesses a broad range of high-level clinical skills, including data collection, interpretation, diagnosis, patient management, communication, and counseling skills. The examination is held at least once a year, preferably in an OSCE format in the form of patient management problems (PMPs). The exam eligibility, format, and passing score will be in accordance with the Commission's training and examination rules and regulations. Examination details and blueprints are published on the commission website: www.scfhs.org.sa

Certification

Certificates of training completion will only be issued upon the resident's successful completion of all program requirements. Candidates passing all components of the final specialty examination are awarded the "Saudi Board in Orthopaedic Surgery" certificate.

Resident evaluations of the program

Training program evaluations are part of the SCFHS commitment to excellence in teaching and learning. The SCFHS guides training improvement by evaluating the effectiveness of the educational program in an ongoing manner using residents' evaluations of their rotation, program, and faculty and documenting the extent to which the curriculum's objectives have been met.

Residents are asked to complete an evaluation form for each completed rotation, which the director reviews. Residents complete a confidential comprehensive program evaluation. The residency coordinator tabulates the responses and comments, which faculty discuss at the educational retreat. In this way, program directors and scientific council carefully weigh the program's overall effectiveness at meeting goals and objectives, as well as each rotation's effectiveness and each institution's contribution to the program.

Three forms of evaluation will be available on the SCFHS website (<http://www.scfhs.org.sa>).

- Faculty evaluation by residents
- Rotation evaluation by residents
- Residency training program evaluation by residents

APPENDICES

Appendix A

Continuous Evaluation Report								
Trainee name: _____								
SCFHS#: _____ Training center: _____								
Level of training:				Rotation dates:				
COMPETENCIES				Meeting Expectations *				
				Rarely	Inconsistently	Generally,		
Medical Expert						Score	Weight %	
• Appropriate basic knowledge								
• Accurate history and physical exam								
• Appropriate clinical decisions								
• Appropriate emergency management								
• Appropriate indication for procedures								
• Performance before, during, & after procedures								
• Clinical skills proficiency								
Subtotal:						/100	50%	
Communicator								
• Appropriate interaction with patient/family/others								
• Accurate documentation								
• Appropriate planning								
• Clear presentation								
Subtotal:						/100	15	
Collaborator								
• Proper interaction with health professionals								
• Proper consultations								
• Proper management of conflicts								
Subtotal:						/100	5	
Manager								
• Proper use of information technology								
• Proper understanding of resources								
• Appropriate time management								
• Follow policies and procedures								
• Maximize benefits to patients								
Subtotal:						/100	10	
Health Advocate								
• Appropriate response to patient health needs								
• Appropriate promotion and participation in patient safety								
Subtotal:						/100	5	
Scholar								
• Participate in appropriate medical education activities								
Subtotal:						/100	10	

APPENDICES

•	Implement an ongoing plan for self-education								
•	Analyze and integrate medical information								
•	Teach others								
•	Completion of the electronic log-book								
Professional									
•	Proper professional attitude						Subtotal: /100	5	
•	Understand medical and legal obligations								
•	Punctual								
•	Maintain ethics and morals								
•	Accept advice								
•	Participate in professional organizations								
Total Score: /100								100	
<p>Comment on the strengths and weaknesses of the candidate. Make direct reference to the objectives and give specific examples wherever possible.</p> 									
Evaluation methods	Mini-CEX	DOPS	OSCE	CBD	MSF	Others (specify):			
Residency training committee approval						Meeting No. Date			
<p>Program Director Name:</p> <p>Date: _____ Signature _____</p>									
<p>Trainee Name: _____</p> <p>Date: _____ Signature: _____</p>									

* Rarely ≤30%, Inconsistently >30–60%, Generally >60–90%, Exceeds >90%

Appendix B

Presentation Rating Form								
Trainee name: _____								
Level: _____ Date of presentation: _____								
Topic: _____								
Please use the following scale to evaluate the presentation:								
Very weak	Weak	Acceptable	Good	Very good		Not applicable		
1	2	3	4	5		N/A		
Medical Expert			1	2	3	4	5	N/A
- Demonstrated thorough knowledge of the topic								
- Presented at the appropriate level and with adequate detail								
- Well-prepared, knows content, and answers questions								
Comments (optional)								
Communicator			1	2	3	4	5	N/A
- Provided objectives and an outline								
- Presentation was clear and organized								
- Used effective methods and presentation style								
- Established good rapport with the audience								
Comments (optional)								
Collaborator			1	2	3	4	5	N/A
- Invited comments from learners and led discussions								
- Worked with supervisor/team effectively in preparing the session								
Comments (optional)								
Health advocate			1	2	3	4	5	N/A
- Managed time effectively								
- Addressed preventive aspects of care								
Comments (optional)								
Scholar			1	2	3	4	5	N/A
- Posed appropriate learning questions								
- Accessed and interpreted the relevant literature								
Comments (optional)								
Professional			1	2	3	4	5	N/A
- Maintained patients' confidentiality if clinical material was used								
- Identified and managed relevant conflicts of interest								
- Supported conclusions with relevant convincing evidence								
Comments (optional)								
Overall Performance								

APPENDICES

Did Not Meet Expectations	Short of Expectations	Met Expectations	Exceeded Expectations	Far Exceeded Expectations
Comments:				
Evaluator Name: _____				
Evaluator Signature: _____				

Appendix C

Case-Based Discussion (CBD)

Definition

The purpose of a Case-Based Discussion (CBD) encounter is to evaluate the level of professional judgment exercised in clinical cases by the trainee. CBD is designed to:

- Guide the trainee's learning through structured feedback
- Help improve clinical decision-making, clinical knowledge, and patient management
- Provide the trainee with an opportunity to discuss their approach to the case and identify strategies to improve their practice
- Serve as a teaching opportunity, enabling the evaluator to share their professional knowledge and experience.

Overview

A CBD encounter involves a comprehensive review of clinical cases between a trainee and evaluator. The trainee is given feedback from an evaluator across a range of areas relating to clinical knowledge, clinical decision-making, and patient management. A CBD encounter lasts approximately 20–30 minutes.

Trainee responsibilities

- Arrange a CBD encounter with an evaluator.
- Provide the evaluator with a copy of the CBD rating form.

Evaluator responsibilities

- Choose the case(s) for discussion.
- Use the CBD form to rate the trainee.
- Provide constructive feedback and discuss improvement strategies.
- Provide an overall judgment on the trainee's clinical decision-making skills.

Case-based discussion rating form

Case-based discussion rating form									
Trainee name: _____									
Registration no: _____					Residency level: _____				
Date: _____									
Brief summary of case:									
<input type="checkbox"/> New case <input type="checkbox"/> Follow-up case									
Assessment setting: <input type="checkbox"/> Inpatient <input type="checkbox"/> Ambulatory <input type="checkbox"/> ICU <input type="checkbox"/> CCU <input type="checkbox"/> Emergency department <input type="checkbox"/> Other _____									
Complexity: <input type="checkbox"/> Low <input type="checkbox"/> Moderate <input type="checkbox"/> High									
Focus: <input type="checkbox"/> Data gathering <input type="checkbox"/> Diagnosis <input type="checkbox"/> Therapy <input type="checkbox"/> Counseling <input type="checkbox"/> Other _____									
Assessment									
SCORE FOR STAGE OF TRAINING									
Questions	Unsatisfactory			Satisfactory			Superior		
	1	2	3	4	5	6	7	8	9
Medical record documentation									
Clinical assessment									
Investigation and referrals									
Treatment									
Follow-up and future planning									
Professionalism									
Clinical judgment									
Leadership/managerial skills									
Overall performance									
Suggestions for development: 1- 2- 3-									
Evaluator name: _____									
Evaluator signature: _____									

Appendix D

Direct Observation of Procedural Skills (DOPS)

The direct observation of procedural skills, commonly referred to as DOPS, is one of the workplace-based assessment (WBA) tools. DOPS is a structured checklist for assessing competence in performing diagnostic and interventional procedures. It facilitates feedback in order to develop behaviors and performance related to operative, decision-making, communication, and teamwork skills. The assessment is formative, aimed at guiding further development of practice.

Direct Observation of Procedural Skills (DOPS) Rating Form			
Trainee's name:			
Registration #:			
Procedure Observed:			
Observed by:		Date:	
Signature of observer:			
Description	Satisfactory	Unsatisfactory	Comment
Understood the indications for the procedure and clinical alternatives			
Explained plans and potential risks to the patient clearly and in an understandable manner			
Good understanding of the theoretical background, including anatomy, physiology, and imaging, of the procedure			
Good advanced preparation for the procedure			
Communicated the procedural plan to relevant staff			
Explained procedure to the patient and obtained valid informed consent			
Aware of cross-infection risks and demonstrated an effective aseptic technique during the procedure			
Procedure success or failure was understood in the current setting			
Coped well with unexpected problems			
Demonstrated awareness through constant monitoring, maintained focus			
Demonstrated confidently correct procedural sequence, minimal hesitation			
Skillful and handled patient and tissues gently			
Maintained accurate and legible records including descriptions of problems or difficulties			
Issued clear postprocedural instructions to the patient and/or staff			
Sought to work to the highest professional standards at all times			

ASSESSMENT	
Practice was satisfactory	
Practice was unsatisfactory	
<p>Examples of good practice:</p> <p>Areas of practice requiring improvement:</p> <p>Further learning and experience should focus on the following:</p>	

Appendix E

Mini-Clinical Evaluation Exercise (Mini-CEX)

The mini-CEX is a 10–20-minute direct observation assessment or “snapshot” of a trainee-patient interaction. To be most useful, the evaluator should provide timely and specific feedback to the trainee after each assessment of a trainee-patient encounter.

Purpose

A mini-CEX is designed to:

- Guide the trainee’s learning through structured feedback
- Help improve communication, history taking, physical examination, and professional practice
- Provide the trainee with an opportunity to be observed during interactions with patients and identify strategies to improve their practice
- Serve as a teaching opportunity, enabling the evaluator to share their professional knowledge and experience.

Overview

A mini-CEX encounter involves a trainee being observed in their workplace, consulting with a patient. The trainee is given feedback across a range of areas relating to professional qualities and clinical competence from an evaluator immediately after the observation.

Trainee responsibilities

- Arrange a mini-CEX encounter with an evaluator.
- Provide the evaluator with a copy of the mini-CEX rating form.

Evaluator responsibilities

- Choose an appropriate consultation for the encounter.
- Use the mini-CEX rating form to rate the trainee.
- Provide constructive feedback and discuss improvement strategies. If a trainee receives a rating that is unsatisfactory, the assessor must complete the 'Suggestions for Development' section. The form cannot be submitted if this section is left blank.

Mini-Clinical Evaluation Exercise (Mini-CEX) Rating Form									
Trainee name: _____									
Registration no.: _____					Residency level: _____				
Date: _____					Mini-CEX time: _____ min				
Observing: _____ min					Providing feedback: _____ min				
Brief summary of case:									
<input type="checkbox"/> New case <input type="checkbox"/> Follow-up case									
Assessment setting: <input type="checkbox"/> Inpatient <input type="checkbox"/> Ambulatory <input type="checkbox"/> ICU <input type="checkbox"/> CCU <input type="checkbox"/> Emergency department <input type="checkbox"/> Other _____									
Complexity: <input type="checkbox"/> Low <input type="checkbox"/> Moderate <input type="checkbox"/> High									
Focus: <input type="checkbox"/> Data gathering <input type="checkbox"/> Diagnosis <input type="checkbox"/> Therapy <input type="checkbox"/> Counseling <input type="checkbox"/> Other _____									
ASSESSMENT: SCORE FOR STAGE OF TRAINING									
Questions	Unsatisfactory			Satisfactory			Superior		
	1	2	3	4	5	6	7	8	9
History taking									
Physical examination skills									
Communication skills									
Critical judgment									
Humanistic quality/professionalism									
Organization and efficiency									
Overall clinical care									

APPENDICES

Suggestions for development: 1- 2- 3- Evaluator name: Evaluator signature:	
Question	Description
History taking	Facilitates patients' narrative; uses appropriate questions to obtain accurate, adequate information effectively; responds to verbal and nonverbal cues appropriately
Physical examination skills	Follows an efficient, logical sequence; examinations are appropriate for clinical problems; provides patients with explanations; is sensitive to patients' comfort and modesty
Communication skills	Explores patients' perspectives; uses jargon-free speech; is open and honest; is empathetic; agrees on management plans and therapies with patients
Critical judgment	Forms appropriate diagnoses and suitable management plans; orders selectively and performs appropriate diagnostic tests; considers risks and benefits
Humanistic quality/professionalism	Shows respect, compassion, and empathy; establishes trust; attends to patients' comfort needs; respects confidentiality; behaves in an ethical manner; is aware of legal frameworks and his or her own limitations
Organization and efficiency	Prioritizes; is timely and succinct; summarizes
Overall clinical care	Demonstrates global judgment based on the above topics

Appendix F

Final In-Training Evaluation Report (FITER)/Comprehensive Competency Report (CCR)

There will be 9 comprehensive evaluation forms, which cover all CanMEDS competencies. Forms are available at the SCFHS website.

Final In-Training Evaluation Report (FITER)/Comprehensive Competency Report (CCR) Form		
Trainee Name: _____		
Trainee SCFHS number: _____		
Evaluation covering the last year as a resident: _____		
In the view of the Residency Program Committee, the trainee mentioned above has acquired the competencies of the specialty/subspecialty as prescribed in the Objectives of Training and is competent to practice as a specialist.		
<u>Exam/Evaluation</u>	YES	NO
• Written exams		
• Oral exams		
• Clinical observations (e.g., CERs) from faculty		
• OSCEs		
• Feedback from healthcare professionals		
• Completion of a scholarly project		
• Other evaluations:		
Name of Program Director/Assessor for CCR: _____		
Date: _____ Signature: _____		
This is to attest that I have read this document.		
Name of Trainee: _____		
SCFHS number: _____		
Date: _____ Signature: _____		
TRAINEE'S COMMENTS:		
Note: If, during the period from the date of signature of this document to the completion of training, the Residency Program Committee judges that the candidate's demonstration of competence is inconsistent with the present evaluation, it may declare the document null and void and replace it with an updated FITER. Eligibility for the examination would be dependent on the updated FITER.		
COMMENTS:		

FITER: (Medical Expert Competency)

Trainee Name: _____						
Trainee SCFHS number: _____						
	EXPECTATIONS					
	* Rarely meets	* In consistently meets	* Generally meets	* Sometimes exceeds	* Consistently exceeds	Not applicable
MEDICAL EXPERT						
a. Possesses basic scientific and clinical knowledge relevant to specialty						
b. Performs histories and physical examinations that are complete, accurate, and well-organized						
c. Uses all pertinent information to arrive at complete and accurate clinical decisions						
d. Recognizes and manages emergency conditions resulting in prompt and appropriate treatment. Remains calm, acts in a timely manner, and prioritizes correctly						
e. Recognizes and appropriately manages patients with complex problems and multi-system disease						
f. Demonstrates proficiency in preoperative and postoperative patient management, including indications for surgical intervention						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible.						
<ul style="list-style-type: none"> * Rarely meets ≤30% * Inconsistently meets >30–60% * Generally meets >60–80% * Sometimes exceeds >80–90% * Consistently exceeds >90% 						

FITER: (Procedures and Clinical Skills Competencies)

Trainee Name: _____						
Trainee SCFHS number: _____						
	EXPECTATIONS					
	* Rarely meets	* Inconsistently meets	* Generally meets	* Sometimes exceeds	* Consistently exceeds	Not applicable
PROCEDURES AND CLINICAL SKILLS						
a. Demonstrates the ability to perform diagnostic and therapeutic procedures/skills described in the Specialty Curriculum						
1. Endoscopic Procedures						
•						
2. Open Surgical Procedures						
•						
3. Laparoscopic Procedures						
•						
4. Other Procedures						
•						
5. Clinical Skills						
•						
b. Minimizes risks and discomforts to the patient						
c. Overall is proficient in procedures and clinical skills						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible.						
* Rarely meets ≤30% * Inconsistently meets >30–60% * Generally meets >60–80% * Sometimes exceeds >80–90% * Consistently exceeds >90%						

FITER: (Communicator Competency)

Trainee Name: _____						
Trainee SCFHS number: _____						
	EXPECTATIONS					
	* Rarely meets	* Inconsistently meets	* Generally meets	* Sometimes exceeds	* Consistently exceeds	Not applicable
COMMUNICATOR						
a. Establishes a therapeutic relationship with patients and communicates well with the family. Provides clear and thorough explanations of diagnosis, investigation, and management in a professional manner. Demonstrates empathy and sensitivity to racial, gender, and cultural issues						
b. Prepares documentation that is accurate and timely						
c. Develops diagnostic and therapeutic plans that are understandable to patients and clear and concise for other healthcare personnel, including other consultants						
d. Presents clinical summaries and scientific information in a clear and concise manner to a healthcare audience						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible.						
* Rarely meets ≤30% * Inconsistently meets >30–60% * Generally meets >60–80% * Sometimes exceeds >80–90% * Consistently exceeds >90%						

FITER: (Collaborator Competency)

Trainee Name: _____						
Trainee SCFHS number: _____						
	EXPECTATIONS					
	* Rarely meets	* Inconsistently meets	* Generally meets	* Sometimes exceeds	* Consistently exceeds	Not applicable
COLLABORATOR						
a. Interacts effectively with health professionals by recognizing and acknowledging their roles and expertise						
b. Consults and delegates effectively						
c. Establishes good relationships with peers and other health professionals						
d. Effectively provides and receives information from other health professionals						
e. Manages conflict situations well						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible.						
<ul style="list-style-type: none"> * Rarely meets ≤30% * Inconsistently meets >30–60% * Generally meets >60–80% * Sometimes exceeds >80–90% * Consistently exceeds >90% 						

FITER: (Manager Competency)

Trainee Name: _____

Trainee SCFHS number: _____

	EXPECTATIONS					
	* Rarely meets	* Inconsistently meets	* Generally meets	* Sometimes exceeds	* Consistently exceeds	Not applicable
MANAGER						
a. Understands and makes effective use of information technology, such as methods for searching medical databases						
b. Makes cost-effective use of healthcare resources based on sound judgment						
c. Prioritizes and uses personal and professional time effectively in order to achieve a balanced personal and professional life						
d. Demonstrates an understanding of the principles of practice management						
e. Demonstrates the ability to effectively utilize healthcare resources to maximize benefits to all patients, including managing waiting lists						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible.						
<ul style="list-style-type: none"> * Rarely meets ≤30% * Inconsistently meets >30–60% * Generally meets >60–80% * Sometimes exceeds >80–90% * Consistently exceeds >90% 						

FITER: (Health Advocate Competency)

Trainee Name: _____						
Trainee SCFHS number: _____						
	EXPECTATIONS					
	* Rarely meets	* Inconsistently meets	* Generally meets	* Sometimes exceeds	* Consistently exceeds	Not applicable
HEALTH ADVOCATE						
a. Understands the specialist’s role to intervene on behalf of patients with respect to the social, economic, and biological factors that may impact their health						
b. Understands the specialist’s role to intervene on behalf of the community with respect to the social, economic, and biological factors that may impact community health						
c. Recognizes and responds appropriately in advocacy situations						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible.						
<ul style="list-style-type: none"> * Rarely meets ≤30% * Inconsistently meets >30–60% * Generally meets >60–80% * Sometimes exceeds >80–90% * Consistently exceeds >90% 						

FITER: (Scholar Competency)

Trainee Name: _____						
Trainee SCFHS number: _____						
	EXPECTATIONS					
	* Rarely meets	* Inconsistently meets	* Generally meets	* Sometimes exceeds	* Consistently exceeds	Not applicable
SCHOLAR						
a. Demonstrates an understanding of, and a commitment to, the need for continuous learning. Develops and implements an ongoing and effective personal learning strategy						
b. Critically appraises medical information by asking relevant questions and determining which information is reliable. Successfully integrates information from a variety of sources.						
c. Understands the principles of adult learning and helps others learn by providing guidance, teaching, and constructive feedback						
d. Facilitates the learning of patients, other house staff/students, and other health professionals						
e. Completes the electronic log book in a timely fashion						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the specific objectives and give specific examples wherever possible.						
<ul style="list-style-type: none"> * Rarely meets ≤30% * Inconsistently meets >30–60% * Generally meets >60–80% * Sometimes exceeds >80–90% * Consistently exceeds >90% 						

FITER: (Professional Competency)

Trainee Name: _____						
Trainee SCFHS number: _____						
	EXPECTATIONS					
	* Rarely meets	* Inconsistently meets	* Generally meets	* Sometimes exceeds	* Consistently exceeds	Not applicable
PROFESSIONAL						
a. Demonstrates integrity, honesty, compassion, and respect for diversity						
b. Fulfills medical, legal, and professional obligations of the specialist						
c. Meets deadlines and demonstrates punctuality						
d. Monitors patients and provides follow-up						
e. Understands the principles of ethics and applies these in clinical situations						
f. Demonstrates an awareness of limitations and seeks advice when necessary. Accepts advice graciously						
g. Demonstrates respect toward other physicians and healthcare workers						
h. Participates in professional organizations—local, provincial, and national						
Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible.						
<ul style="list-style-type: none"> * Rarely meets ≤30% * Inconsistently meets >30–60% * Generally meets >60–80% * Sometimes exceeds >80–90% * Consistently exceeds >90% 						

