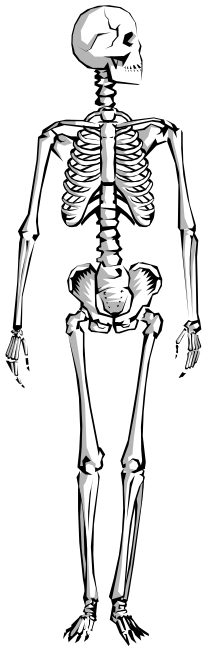
Policies and Objectives for Postgraduate Training in Orthopaedic Surgery



Faculty of Orthopaedics

Kuwait Institute for Medical Specialization (KIMS)

Policies and Objectives for Postgraduate Training in Orthopaedic Surgery

A Guideline for Residents and Teaching Staff

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Introduction

In translation term from its Greek root the term Orthopaedic means "straight child". The responsibility of the Orthopaedic Surgeon is to maintain and restore proper function of the musculoskeletal system, not only children but also in patients of all ages.

The purpose of this handbook is to act as a guide for both Orthopaedic Residents and Teaching Staff with regards to the policies and objectives of the "Kuwaiti Board of Orthopaedic Surgery".

The policies outlined in this book are those related to the Orthopaedic Training Program at the primary base teaching hospital (AlRazi). The affiliated teaching hospitals may have specific policies with regards to day to day activities and the resident should meet with the attending staff at the beginning of each rotation to familiarize themselves with the institution policy. It is the staff's responsibility to be sure that the resident is aware of any institutional policy not outlined in this handbook.

The objectives outlined for the various CORE and Orthopaedic Rotations are meant to be a good guide, comprehensive, and posted later in this document.

The Residents and staff must be aware that the volume of Orthopaedic knowledge is expanding at an explosive rate and that one of the necessities in being an Orthopaedic Surgeon is to try to keep current through life-long learning. Similarly, although the objectives are rotation-specific, far more can be accomplished in each rotation than is outlined on these objectives. In all but the last rotation, the Resident will be presented with considerable opportunity to achieve these objectives during any number of rotations. Specifically, each resident will have more than one overlapping rotation in the primary subspecialty disciplines. What might not have been accomplished in one rotation will become the objectives of the next.

Upon completion of training, a resident is expected to be a competent specialist in Orthopedic 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
satisfactory knowledge of the principles common to all 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, culture, ethnicity and ethics in a professional manner.

Mission

The purpose of the Orthopaedic Training Program is to produce Orthopaedic Surgeons for a future unsupervised practice who are capable of providing for the total care of patients referred in either elective or emergency circumstances. In addition to technical skills we expect to provide an effective Orthopaedic Surgeon who will know to question, examine, diagnose, treat, follow and demonstrate appropriate professional attitudes toward patients and their families, colleagues and other members of the health care team. At the end of his or her training program, such a candidate should be proficient with the entire spectrum of general Orthopaedic Surgery and be poised for further fellowship training of particular interest or need.

In addition, the candidate completing this program will be admissible to the examinations for certification in Orthopaedic Surgery of the "Kuwait Institute for Medical Specialization", with confidence of the program that his/her training and abilities are sufficient to expect success on the first attempt.

On completing training, the Orthopaedic graduate will be capably qualified not just as a medical expert but also as a clinical decision maker, effective communicator, skilled collaborator, informed manager and health advocate. He/she will be a lifelong scholar and medical professional.

Program Design

1. Length

The complete Orthopaedic Program at KIMS is five years in length. This takes the resident through two years of core, from he or she masters the principles of surgery in general and is prepared to pass the Principles of Surgery examination. The subsequent three years are devoted to specific rotations in Orthopaedic Surgery.

2. Rotations

The Residents in Orthopaedic Surgery will initially participate in a CORE program compatible with CORE programs of other surgical specialties. Completion of the CORE rotations, as well as participation in the CORE seminars in surgery in general should prepare the candidate to take the Principles of Surgery Examination at the end of their PGY2 year.

PGY1:

General Surgery (Trauma) – 2 months

General Orthopaedics – 4 months

ICU – 2 months

ER – 2 months

Rehabilitation Medicine –2 months

PGY2:

General Orthopaedics –6 months

Neurosurgery – 2 months

Plastic Surgery – 2 months

Vascular Surgery – 1 month

Radiology/Pathology – 1 month

Orthopaedic Rotations:

Specific orthopaedic training starts with 4-month junior rotations in the PGY1 year. In the PGY1 year the trainee will participate in Rehabilitation Medicine which is a Medicine rotation with specific concerns of the medical progress of the patients but with focus in on the Rehabilitation of patients with musculoskeletal problems. During this rotation the trainee will be exposed to rehabilitation of amputees, neurologically injured patients and other disabling conditions. The Resident will also participate in the assessment of patients with rheumatologic conditions.

In the PGY2 year as well the resident will participate in a rotation involving radiology, and pathology. This is a very busy rotation during which the resident will learn to assess x-rays, general musculoskeletal problems, as well as specific evaluation of pathologic bone lesions. During this time he/she will also develop the ability to assess the histology of musculoskeletal tumours and other pathology.

PGY3:

Orthopaedic Trauma (Junior Rotation) – 3 months

Joint Reconstruction & Arthroplasty (Junior Rotation) – 3 months

Oncologic Orthopaedic Surgery – 3 months

Paediatric Orthopaedic Surgery (Junior Rotation) – 3 months

PGY4:

Sports Medicine – 3 months

Spine Surgery – 3 months

Upper Extremity – 3 months

Hand Surgery – 3 months

PGY5:

Orthopaedic Trauma (Senior Rotation) – 3 months

Paediatric Orthopaedic Surgery (Senior Rotation) – 3 months

Foot & Ankle – 3 months

Joint Reconstruction & Arthroplasty (Senior Rotation) – 3 months

3. Guiding Principles:

The training must take place in the co-operative environment of the participating hospitals. Residents will be given increasing levels of technical responsibility consistent with their knowledge, judgment, technical ability, and attitudes at the discretion of the Attending staff.

There is an obligation on the part of the Resident to contribute to the function of the clinical unit. Satisfactory participation in the pre- and post-operative care of the patient is not the only objective of Resident training, but creation and support of a learning environment within which maximum learning takes place. Junior residents are discouraged from "honing in" on specific areas in Orthopaedic surgery to the potential detriment of other areas of their education. Consultants are encouraged to involve themselves aggressively with the ongoing care of their patients so that the Orthopaedic Resident can pursue his or her other duties.

Throughout their training Residents must learn to balance their dual roles of trainees and providers of medical service. The program recognizes the primary role of education and strives to protect educational time and activities from encroachment by Service commitments. The program expects commitment from the Teaching staff to participate in educational activities of the program. The Residents will also expect teaching from consultants at:

1. Daily Orthopaedic Rounds
2. Orthopaedic Surgery Seminars
3. Out-Patient Clinics
4. Operating Rooms
5. Residents' Day
6. Journal Club
7. Morbidity & Mortality Monthly Rounds

4. Guidelines Regarding Supervision of Postgraduate Training

The successful training for future unsupervised practice requires the postgraduate clinical trainee to actively participate in the provision of health care; i.e. have hands-on experience in the system of delegated and graded responsibility. The degree of supervision is determined by two components:

i. The Responsible Physician:

Choosing the appropriate degree of trainee supervision places a finely balanced weight of responsibility on the clinical teacher. This is a balance between personal responsibility for the nature and quality of patient care, and the established process of delegation of appropriate responsibilities for the patient care to a trainee for educational purpose.

ii. The Trainee:

The trainees are neither independent practitioner nor are they specialists. They are pursuing their individual objectives towards independence in a graded fashion, providing health care services under the appropriate supervision of their assigned clinical teachers.

The ability to function independently does not come suddenly at the end of training, but is a progressive and selective process. The degree of independence and the type rendered independently corresponds to the level of training and the progress of the trainee.

Exchange of Information between Clinical Teachers and Trainee:

Adequate supervision is dependent upon an ongoing exchange of information. Thus, the trainee, by accepting responsibility from the supervisor, must accept the responsibility of documenting and keeping the supervisor informed of his or her actions.

5. Administration:

The Orthopaedic Training Program is managed by the Program Director and the Orthopaedic Residency Program Committee, which is responsible to the Chairman of Orthopaedic Faculty at Kuwait Institute for Medical Specialization (KIMS).

The Orthopaedic Residency Program Committee consists of the Chairman of Orthopaedic Faculty, Program Director, Chairman of the Orthopaedic Council and the heads of the Orthopaedic Departments at Adan, Jahra and Farwaniya Hospitals.

The responsibility of the Orthopaedic Committee includes:

i. Selection of trainees
ii. Assignment of rotations compatible with the objectives of the program
iii. Ensuring formal and informal regular evaluation with feedback and promotion
iv. Reviewing rounds, educational events and discussing any problems identified.

Faculty and program evaluation and training are also the task of the Orthopaedic Residency Program Committee. The committee meets at least quarterly and minutes are kept.

Since stress is a potential problem in any surgical training program, as a stress handling mechanism all Residents in the program are strongly encouraged to choose a designated mentor, such as a consultant or other Resident in whom the Resident may confide.

6. On-Call Schedule:

The resident should follow the on-call schedule of the allocated group.

7. Vacation Policy:

Full approval has to be given before making holiday plans. The format for approval requires that the Resident obtain signed approval from the head of the service involved, the person assigned to making up the call list for that Service,

and the Program Director. This should be done at least four weeks prior to the proposed commencement of the vacation.

The program strongly recommends that no holiday be taken by Senior Residents during the first two or first two weeks of commencement of the academic year. This would be seen as a courtesy to junior Residents on the Service and to the Orthopaedic patients.

Recognizing the limited Off-Service training exposure available in several of our 1-month Core Off-Service rotations, residents are strongly discouraged from taking vacation time during these rotations.

Also, residents are encouraged to schedule vacation absence so as to not be absent for more than 25% of the scheduled time of any rotation block. Greater absence will be considered to inadequate training and may require remediation.

8. Research:

Residents are encouraged and expected to mount individual projects in clinical research or basic laboratory research as part of their regular training activities. Residents are encouraged to develop their own interests and pursue research consistent with their own interest. They are encouraged to seek assistance in planning or material acquisition from the teaching staff and help with research design from staff or parts of Kuwait University.

The Resident may wish to participate in ongoing research of the staff. This should only be undertaken if the Resident shares an interest in this research. The Orthopaedic Residency Program Committee does not wish Resident research to be dictated by the interests of the staff.

It is expected that each Resident will mount some form of presentation during each and every year of his training commencing at the PGY2 level. Certainly PGY1 Residents are encouraged and permitted to participate. Core Residents in the PGY1 and PGY2 year may participate in the annual Surgical Residents' Day and are eligible for the prizes. All Orthopaedic Residents from PGY1 to PGY5 are invited to participate in the annual Orthopaedic Residents' Day, to present their papers, and be eligible for prizes.

Cognitive Objectives

At the completion of training the Resident will have a comprehensive knowledge of:

1) Histology, pathology, bio-chemistry of bone, muscle, tendon, ligament and skin.
2) Basic tissue, joint, materials and fracture biomechanics.
3) Wound healing and bone healing both normal and abnormal.
4) Pathophysiology and managements of all aspects of fracture healing.
5) The principles of immunology as they relate primarily to bone transplantation and soft tissue transplantation.
6) The genetics embryology and anatomy, a pathophysiology of congenital deformities commonly managed by orthopaedic surgeons.
7) Sepsis especially as it applies to operative care (wound and systemic).
8) Pharmacology including principles of metabolism action and toxicity of drugs commonly used in this specialty.
9) Pathology and treatment of neoplasm, of bone, cartilage, skin and soft tissue.
10) Medical legal and ethical aspects of orthopaedic surgery.
11) Approach to reconstruction of commonly encountered conditions.

Clinical and Technical Objectives

General / Chief Resident:

The capability of independent patient care in all aspects of Orthopaedic surgery including investigation, diagnosis and management design, both acute and long term. This would include all aspects of soft tissue injury, tumours, wound healing variants, bone healing, sports medicine, arthroplasty surgery and liabilities.

In the development of clinical skills there shall be equal emphasis on the child and the adult. Progress in the program will be demonstrated by increasing sophistication and the ability to manage the patient's pre-operative and post-operative care. Preparation for unusual cases will by necessity be conducted by direct liaison with supervising staff; this supervision should be called upon whenever there is any doubt on the part of the Resident about the management of any situation. Another facet of training at this level is the initial assessment and resuscitation .of emergency cases.

It is expected that the recognition of the gravity of a particular case will prompt early action to obtain appropriate assistance. Under no circumstances should patient care be, or appear to be, jeopardized or delayed if a Resident is the least bit uncertain about the issue.

A similar level of progress is to be anticipated throughout the progression of training. A more senior Resident should be able to offer advice and supervision to more junior learners and himself seek help only in cases which are unusual or of great severity. While a junior Resident, the judgement necessary to seek such advice must develop. In a more senior Resident, failure to exercise that judgement would be regarded as unsatisfactory component of performance.

The Chief Resident in Orthopaedic Surgery should demonstrate his or her use of all learning to date, including experience on sub-speciality rotation, to formulate appropriate management plans for all but the most complex

problems. It should rarely be necessary for supervising staff to change a Senior Residents' planned management because of its medical inappropriateness.

Throughout the first year of training the Residents participation in the consultative process will also be through supervising staff. Although cumulative learning should constantly decrease the variation between the opinion the Resident would render and the supervising staff.

At the Chief Resident level, it is expected that the level of opinion cast would simulate that of the attending staff; at this point a substantive role in consultation to peers and colleagues begins. The ability to provide appropriate hospital wide consultation is a critical component in the programs decision to advance a candidate to the certifying examination.

Also expected of the Chief Resident is complete patient care, pre-operative, inter-operative, and post-operative, monitored by the senior staff, but rarely necessitating direction or overriding. The organization of the service needs of the institution, the learning needs of the junior Residents and others, as well as participation in quality care monitoring, i.e. Mortality Rounds, hospital audits etc., are also demanded of the Chief Resident about to embark on an independent practice.

Out-Patient Experience:

The capabilities of a consulting surgeon are not related to hospital work alone but involve experience with many problems of a non-emergent nature encountered in an out-patient clinic setting.

In many selective situations the decisions about most appropriate management, (especially the decision as to whether a problem warrants operative intervention) is made in such a setting. As well, long term follow-up and continuity of care can only be appreciated in this setting.

Competence in all technical aspects of Orthopaedic surgery procedures, competence in pre and post-operative care, and the ability to select the

appropriate procedure to fit the clinical situation and to recognize his/her limitations is expected. In particular, this includes competence in all types of emergency and fracture techniques.

Competence is expected in all common procedures of Paediatric Orthopaedics including trauma care and common reconstructive techniques. In adult surgery, competence is expected in the treatment of most acute bony injuries requiring both open and closed techniques.

Competence is also expected in most reconstructive situations. There are areas involving complex reconstruction and revision procedures that are not the objective of the program. If they are to be undertaken in independent practice further Fellowship training is recommended. It is not the objective of the program that every case is done by a Resident; even at the most senior level there is something to be learned by assisting the surgeon with a straightforward procedure.

As a general rule, junior Residents will perform operations with the assistance of the attending surgeon or Chief Resident. The Chief Resident level, the opportunity for independent inter-operative care should exist, with an immediate availability of a staff surgeon for advice or assistance when necessary.

Finally, it is mandatory for the Residents to keep a log book of all procedures in which they participate during residency. It is currently demanded by some examination boards, and will possibly be required by all in the future, it is suggested that all operative notes be kept in a binder for future reference.

Attitude and Ethics

The ability to communicate effectively with the patient and the family, compassionate interest and overall understanding of the patient, the ability to recognize the psychological needs of the patient requiring Orthopaedic surgery, the ability to function as a member of a multi-disciplinary health care team, and understanding and acceptance of the obligation of continuing self education, and the teaching of others, the appreciation of the important role at this point that basic and clinic research plays in the critical analysis of current scientific developments related to the speciality, and an awareness of the acceptable and expected result, as well as the unacceptable and unexpected clinical result will be developed.

It is expected that the Orthopaedic trainee will enter the training program with undergraduate knowledge in the principles of ethical practice.

Further refinement of general ethical principles will be offered during the core program and seminars with specific ethical consideration with regards to Orthopaedic practice will be discussed during seminar sessions, whenever appropriate ethical consideration of the treatment of clinical problems or other professional relationships will be discussed in the clinical setting.

Evaluation

Overview:

Evaluation during the Orthopaedic residency program is a continuous and ongoing process. Dialogue between the Resident and supervising staff is critical to this evaluation.

It is essential that the Resident at the beginning of each of his rotations meets with the attending staff to go over the rotation objectives, as well as any personal objectives that he might have, and to clarify any unique policies of the Service or hospital.

It is essential that the Resident arrange to meet with the attending staff at the midpoint of any rotation for formal evaluation of his progress to discuss any problems that may be encountered with the staff.

The Resident must then meet at the end of his rotation to have a formal evaluation prepared on the Orthopaedic Training Program Evaluation forms. The Resident and staff must discuss what is put on the form and acknowledge it by signing the form. The form must be returned to the Program Director in a timely fashion. It is the Residents' responsibility to be sure that his evaluations are complete. The content of the evaluation form is the consensus of the teaching staff not that of the attending staff.

Large Group Objective Evaluation (Exams):

In addition to the regular twice-a-year biannual performance Review with the Program Director, each Resident will participate in the annual Orthopaedic In-Training Examination.

Semi-Annual Review with the Program Director:

Each Resident will meet with the Program Director on an individual basis twice a year to assess progress to date. At this time any personal shortcomings or problems could be discussed with the Program Director on a one to one basis.

Program Feedback:

The Residents are encouraged to evaluate their rotations. This can be done in confidence. The feedback obtained will be used to improve the quality of the program.

Rotation Evaluations:

The rotation evaluations are an important indicator of the Resident's technical, clinical and attitudinal performance.

The term average in the context of the rotational evaluations is an indicator that the Resident is performing at a clearly satisfactory level for his stage of training.

Given a very highly capable group of which the candidate is a member, the term average implies a very high level of performance. Although this evaluation bears a substantial subjective component on the part of the attending staff, experience has shown that the cumulative record of an average performance or better on sequential evaluations tends to be an accurate assessment of an individual's present and future performance. (A poor evaluation has similar implication).

Guidelines for Residents Remediation:

Remediation activity may become necessary from time to time when a Resident might be evaluated as performing unsatisfactorily on a required rotation, or after unsuccessful appeal of same.

Remediation activity shall include the following:

An appropriate remedial rotation addressing the index performance elements of the failed rotation will be designed by the Program Director. This will not necessarily be a simple repeat of the index rotation, but might be.

Remediation activity will be supervised by both an Attending at the remediation site (henceforth "preceptor") who accepts this responsibility, and the Program Director.

The Program Director will review the failure comments with the Resident and preceptor immediately prior to the start of the remediation rotation. Goals and Objectives which must be met by the Resident in the Remedial Rotation will be defined accordingly.

An Interim Evaluation meeting will be held with the Preceptor, Program Director and the Remediation Resident at mid-rotation.

A Final Evaluation meeting will be held with the Preceptor, Program Director and the Remediation Resident at the end of the rotation.

Failure to perform adequately in remediation will result in expulsion from the Program.

Reading List

1. Anatomy

a) Hoppenfeld, S. and deBeer, P. Surgical Exposures in Orthopedics - The Anatomic Approach JB Lippincott 1994 (or later) ISBN = 0-7817-4228-5 (Essential for oral exams and gives detailed orthopedic anatomy to supplement with other texts).
b) Fowles, J. Anatomy and Physiology, (the most helpful book of all - A MUST! Know every single word of the anatomy section and just read the physiology section as a review).
c) Shell, F. Clinical Anatomy for Medical Students, (Easy reading and adds to the previous source),

2. Basic Science

a) Cruess and Rennie. Adult Orthopedics, Volume I. (Easy reading, skim through cartilage chapter as it is too long).
b) Albright and Brand. Basic Science in Orthopedics. (Chapters on joint lubrication and muscle were helpful).
c) Owen and Goodfellow. (More complete and updated than Albright).
d) Nordin MF, Frankel VH. Basic Biomechanics of the Musculoskeletal System, 3rd edition Lippincott, Williams & Williams, Philadelphia, 2001 ISBN 0-683-30247-7

3. Adult Orthopaedics

Cruess and Rennie. Adult Orthopedics, Volume II. (In the written exam the questions are basically easy so this is probably enough

4. Paediatrics

Lovell and Winter. Pediatric Orthopedics. Volume I & II. (Very useful and must know well).

5. Tumours

a) Spjut et al. Tumours of Bone and Cartilage. (Very helpful -complete coverage of pathology but you should look up the latest information on chemotherapy drugs and their side effects elsewhere).
b) Huvos. Bone Tumours. (Good for information).
c) Sissons HA, Murray RO, Kemp HBS. Orthopedic Diagnosis - Clinical, Radiological and Pathological Correlates Springer-Verlag, 1984 (or later) ISBN 0-387-12795-X. (Easy reading, excellent review with lots of x-rays and sample questions not only in tumours but general orthopedics as well, very helpful).
d) Dahlin. Bone Tumours - General Aspects and Data. (Good for data).
e) Enneking WF. Musculoskeletal Tumor Surgery Churchill Livingstone 1983 (or later)ISBN0-443-08092-5

6. Hand

a) Green DP. Operative Hand Surgery Churchill Livingstone 1982. ISBN 0-443-08090-9 or ideally a more current edition.
b) Campbells. (Dated but most questions are from it).

7. Trauma

a) A.T.L.S. Manual. (Go over at least once carefully).

b) Browner BD, Jupiter JB, Levine AM, and Trafton PG, eds. Skeletal Trauma WB Saunders, 1992. ISBN 0-7216-27269-9-1
c) Rockwood CA and Green DP, eds. Fractures in Adults and Children ISBN #: 0-7817-5160-8
d) Wiss DA, editor. Master Techniques in Orthopedic Surgery: Fractures 2nd edition.
e) Lippincott-Raven ISBN = 0-7817-5290-6
f) Hoppenfeld S, deBeer P. Surgical Exposures in Orthopedics - The Anatomic Approach JB Lippincott 1994 (or later) ISBN = 0-7817-4228-5

8. Fractures

a) Rockwood and Green, Fractures in Adults, Volume I, II, III. (Highly recommended).
b) A.O. Manual.

9. Surgical Exposures

a) Arnold K Henry. E Exposure, 2nd Edition, Churhill Livingston, 1979. (A must read!)
b) Stanley Happenfeld. Surgical Exposures in Orthopedics. T.B. Lippincott Co. 1984
c) The Ruedi Surgical Principles for Internal Fixation. Springer-Verlas, 1984.

10. Spine

a) Weinstein A Wiesel. The Lungar Spine, Sanders 1990.
b) Frymoyer JW, editor. The Adult Spine. Principles and Practice 3rd edition Lippincott Williams & Wilkins, Philadelphia, 2004 ISBN 0-7817-3549-1.
c) R.C. Watilins. Surgical Approaches to the Spine. Springer-Verlas, 1983.

Objectives of Core Program

General Surgery / Trauma:

General Objectives:

1. To investigate and manage general surgical patients with acute and chronic illness.
2. To improve depth of knowledge, technical skills and decision-making capacity with respect to the general surgical patient.
3. To gain knowledge and management skills in the Principles of Surgery.

Medical expert:

I. Knowledge:

- Principles of Surgery and post-operative problems
  - Fluid and electrolyte disorders, acid-base disturbances.
  - Cardiogenic, hypovolemic and septic shock.
  - Wound infection, dehiscence and evisceration.
  - Thromboembolic disorders.
  - Atelectasis and pneumonia.
  - Pressure palsy and pressure ulceration.
  - Bladdder retention.
  - Delerium.
  - Organ failure.
  - Malnutrition.
  - Obesity.
  - Specific nutritional deficiencies.
  - Specific coagulation disorders.
  - General Coagulopathies.
  - Transfusion reaction.
  - Organ failure treatable by transplantation.

- Trauma
  - Airway obstruction.
  - Pnuemothorax.
  - Cardiac tamponade.
  - Vascular injury.
  - Face and neck injuries.
  - Myocardial contusion.
  - Pulmonary contusion.
  - Aortic rupture.
  - Tracheobronchial tree injury.
  - Diaphragmatic rupture.
  - Esophageal rupture.

- Specific disease entities/clinical syndromes
  - The acute abdomen.
  - Upper and lower GI bleed.
  - Gastric outlet obstruction.
  - Bowel obstruction.
  - Hernias
  - GI malignancies.
  - Peptic ulcer disease.
  - The jaundiced patient.
  - IBD.

2. Clinical skills:

- Perform a complete, concise and relevant history and physical exam of the general surgical patient.
- Generate an appropriate differential diagnosis.
- Order and interpret appropriate laboratory and imaging procedures.
- Generate an appropriate plan of management, demonstrating knowledge of non-operative and operative treatment modalities.

- Manage patients in the ambulatory setting, demonstrating knowledge of common office techniques and procedures.
- Manage the patient throughout the entire in-hospital course, demonstrating knowledge of and being able to treat potential complications of disease processes and operative procedures.
- Provide a plan for patient follow-up.
- To supervise the management of the critically ill or traumatized patient.

3. Technical skills:

- Assisting in the operating room, developing a facility for anticipation of surgical maneuvers, gentle traction on tissues, an ability to take direction well, to make reasonable suggestions and enquiry, and to contribute to a positive operating room atmosphere.
- Arterial and venipuncture.
- Insertion of NG tube.
- Insertion and removal of central venous line.
- Insertion and removal of chest tube.
- Skin suturing & stapling, knot tying.
- Selection of abdominal incisions.
- Laparotomy and closure of abdominal wall.
- Peritoneal tap.
- Foley catheter insertion.
- Tracheostomy.

Emergency Medicine:

General Objectives:

1. To stabilize and to care for the undifferentiated patient.
2. To develop triage skills appropriate to the management of patients presenting to emergency.
3. To rapidly recognize the acutely ill/injured patient and to develop a systematic approach to his/her assessment and management.
4. To improve depth of knowledge, technical skills and decision-making capacity regarding the critically ill.

Medical expert

I. Knowledge:

- Cardiac arrest, arrhythmias, CHF, MI, severe hypertension
- Shock
- Respiratory failure
- Coma, seizure.
- Sepsis.
- Acid-base disorders.
- Fluid and electrolyte disorders.
- Renal preservation and support.
- The acute abdomen, GI bleed, hollow viscus dysfunction, and hepatobiliary disease.
- Vascular crises.
- Endocrine disturbances in the critically ill related to water and/or glucose metabolism and adrenal, parathyroid and pituitary dysfunction.
- Coagulation disturbances and blood replacement therapy.
- General pharmacology of commonly used drugs in the emergency department.
- Hypo- and hyperthermia conditions.
- Trauma
- Burns.
- Perioperative high risk conditions.

- Intoxications.
- Pre-hospital care including paramedics, ambulance, first-aid providers, poison control, disaster planning.
- X-Ray interpretation.

2. Clinical skills:

- Perform a concise and relevant history and physical exam.
- Generate an appropriate differential diagnosis.
- Order and interpret appropriate laboratory and imaging procedures.
- Generate an appropriate plan of management, demonstrating knowledge of the various non-invasive and invasive procedures.
- Manage the patient throughout the emergency stay including potential complications, and extend one's ability to manage several patients simultaneously.
- Communicate a succinct history identifying relevant problems.
- Coordinate care including referrals to family doctors, consultants, additional services, etc.

3. Technical skills:

- Establishment and maintenance of the airway, including orotracheal and nasotracheal intubation, bag valve mask ventilation.
- Techniques used in advanced cardiac and trauma life support, including defibrillation and cardioversion, and ECG interpretation.
- Techniques of arterial and venous access, including arterial lines, CVP lines, venous cutdowns, and blood gas sampling..
- Thoracentesis, paracentesis.
- Lumbar puncture.
- Physiologic monitoring techniques, including O2 saturation, cardiac output.
- Foley catheter insertion, NG tube insertion, gastric lavage..
- Wound management, including cleaning, use of local anaesthetics and techniques of wound closure.

- Fracture care, including splinting and casting.
- Slit lamp examination.
- Use of Schiotz tonometer.
- Use of external pacemakers.
- Epistaxis care, cauterization and nasal packing.

Intensive Care Rotation:

Medical Expert

1. To understand the role of both aggressive and comfort-oriented care
2. To be able to recognize, diagnose, and understand the causes and mechanisms of respiratory failure
3. To be able to initiate a plan for the investigation and management of acute respiratory failure
4. To understand the mechanisms, and to be able to differentiate the various types of shock
5. To assess and provide acute management of the hypotensive patient
6. To understand the effects and clinical indications for vasopressor and inotropic therapy
7. To institute management and supportive care for patients with sepsis and septic shock
8. To assess and provide immediate support for the patient with suspected intoxication
9. To understand the principles of management of specific toxic ingestions, including supportive measures, means of altering absorption, increasing elimination, and antidotes
10. To assess and institute immediate care for the patient with altered level of consciousness
11. To diagnose and understand the implications of brain death
12. To be able to assess and provide an approach to the patient with multi-organ disease
13. To recognize the causes and complications of acute renal, hepatic, and haematological dysfunction, and to be able to provide immediate support

14. To investigate and manage acute metabolic, electrolyte, and endocrine disorders
15. To provide immediate support for the patient with GI haemorrhage
16. To understand the unique requirements and complications of the multiply injured trauma patient
17. Technical Skills Related to Critical Care Medicine:
    a. To have an understanding of the indications, techniques, and complications of
    b. Oxygen therapy (nasal prongs, masks, nebulizers)
    c. To have an understanding of airway management - suction, oropharyngeal
    d. Airways, endotracheal intubation and non-invasive ventilation
    e. To have an understanding of mechanical ventilation: modes, lung protective
    f. Strategies, weaning and unconventional approaches
    g. To have an understanding of monitoring: ECG, pulse oximetry, invasive and
    h. Non-invasive blood pressure
    i. To have an understanding of invasive hemodynamic monitoring: PA catheter
    j. Insertion and interpretation of hemodynamic data
    k. To have an understanding of venous access - chest tube thoracostomy/
    l. Pericardiocentesis, NG tube insertion/ Blakemore tubes/ bronchoscopy/dialysis

Neurosurgery:

General Objectives:

1. To gain knowledge of central and peripheral nervous system physiology and pathophysiology pertinent to the practice of Orthopaedic Surgery.
2. To gain a working knowledge of central and peripheral nervous system surgery.
3. To gain technical expertise in neurosurgical procedures relevant to an Orthopaedic Resident.

Medical expert

1. Knowledge:

a) Anatomy and physiology of the central and peripheral nervous system.
b) Pharmacology as related to diseases of the central and peripheral nervous system.
c) Assessment and acute resuscitation of the trauma patient with head or spinal injuries, or injury to the peripheral nervous system.
d) Assessment and treatment of a patient with raised ICP.
e) Assessment and treatment of a patient with spinal cord or cauda equina compression.
f) Assessment and investigation of a patient with haemorrhagic or ischemic cerebrovascular disease.
g) Management of the complications of neurosurgical operative procedures, especially CSF leaks/fistulae.

2. Clinical skills:

a) Perform a complete, concise and relevant history and physical exam of the CNS, PNS and axial skeleton.
b) Generate an appropriate differential diagnosis.
c) Order and interpret appropriate laboratory and imaging procedures.
d) Generate an appropriate plan of management, demonstrating knowledge of nonoperative and operative treatment modalities.
e) Manage patients in the ambulatory setting, demonstrating knowledge of common office techniques and procedures.
f) Manage the patient throughout the entire in-hospital course, demonstrating knowledge of and being able to treat potential complications of disease processes and operative procedures.
g) Provide a plan for patient follow-up.

3. *Technical skills:*

a) Assisting in the operating room, developing a facility for anticipation of surgical maneuvers, gentle traction on tissues, an ability to take direction well, to make reasonable suggestions and enquiry, and to contribute to a positive operating room atmosphere.
b) Insertion of lumbar subarachnoid catheter for the treatment of CSF leak/fistulae.
c) Application of a halo ring and institution of traction by pulley weights or vest for the treatment of spinal instability and other techniques, for example:

    i. Become familiar with the use of the operating microscope.
    ii. Positioning of patients for cranial and spinal neurosurgical procedures.
    iii. Application of pin fixation/head rest used in cranial neurosurgery.
    iv. Performance, under supervision, of the following basic spinal procedures: laminectomy, laminotomy, discotomy.

Vascular Surgery:

General Objectives:

1. To develop an understanding of radiologic and non-invasive assessment of arterial, venous, and lymphatic disease.
2. To develop an ability to localize the level of obstruction in exercise-induced leg ischemia by history and clinical examination.
3. To gain technical expertise with arteries and veins pertinent to the practice of an Orthopaedic Surgeon.
4. To gain technical expertise in lower extremity amputation.

Medical expert

1. Knowledge:

- Anatomy, physiology and relevant surgical approach to the arterial and venous supply to the lower extremities, upper extremities, carotid sheath, subclavian artery and vein, abdominal aorta and vena cava, and aortic and iliac bifurcation, as relevant to the practice of an Orthopaedic Surgeon.
- Non-invasive and radiologic assessment of the arterial, venous and lymphatic systems.
- Pharmacology as related to diseases of arteries and veins, especially chronic and acute arterial disease, deep venous thrombosis and pulmonary embolism.
- Natural history of arterial disease processes and outcome of a variety of vascular procedures.
- Arterial insufficiency of the legs.
- Abdominal aortic aneurysm.
- Peripheral aneurysms.
- Carotid vascular disease.
- Diabetes-related vascular disease.
- Varicose veins.
- DVT.
- Compartment syndromes.

2. Clinical skills:

- Perform a complete, concise and relevant history and physical exam of the vascular surgery patient.
- Generate an appropriate differential diagnosis.
- Order and interpret appropriate laboratory and imaging procedures.
- Generate an appropriate plan of management, demonstrating knowledge of non-operative and operative treatment modalities.
- Manage patients in the ambulatory setting, demonstrating knowledge of common office techniques and procedures.

- Manage the patient throughout the entire in-hospital course, demonstrating knowledge of and being able to treat potential complications of disease processes and operative procedures.
- Provide a plan for patient follow-up.

3. *Technical skills*:

- Assisting in the operating room, developing a facility for anticipation of surgical maneuvers, gentle traction on tissues, an ability to take direction well, to make reasonable suggestions and enquiry, and to contribute to a positive operating room atmosphere.
- Control of hemorrhage in emergency situations.
- Femoral arterial embolectomy.
- Exposure of arterial pathology at various sites without injury to the artery or surrounding structures.
- Repair of traumatized artery.
- Vascular anastomosis.
- Fasciotomy.

Plastic Surgery:

Medical Expert/Clinical Decision Maker

The resident is to demonstrate an understanding and management of the plastics patient. He/she is to obtain an appropriate history and perform a physical examination on plastics patients.

(A) General principles of design of incisions, soft tissue handling, methods of skin closure, and grafting and assessment of wound healing.

(B) Hand Injuries:

- Establishment of treatment priorities in both major and minor hand injuries, lacerations, soft tissue defects.
- Principles of management of tendon injuries extensor and flexor, acute and chronic.
- Principles of management of vascular and nerve injuries of the hand.

(C) Burns

- Assessment and management of thermal burns including inhalation burns, evaluation of the depth and extent of the burns, fluid and electrolyte management, antibiotics and surgical principles.

(D) Technical Competence In the following:

- Split thickness skin grafting
- Local flaps
- Tendon repair
- Introduction to or advancement of abilities in microsurgery

Rehabilitation Medicine:

Medical Expert / Clinical Decision Maker

The resident rotating through Rehabilitation Medicine will become familiar with the conservative management of neurologic and musculoskeletal injury and degenerative disease. Setting Rehabilitation rotation will be undertaken in an ambulatory setting which will compromise outpatient service involving specialty and general P.M. and R. Clinics. The Resident is expected to become proficient in managing soft tissue injuries. The resident is also expected to develop skills in specialty areas which include feet, back, hands, seating and Pediatric M.D. areas.

On completion of the rotation the Resident is expected to be capable of understanding and managing the above problems. Additional Objectives During this rotation, the Resident will be exposed to the organization of an ambulatory care setting. He will be able to:

1. Learn to be competent in the evaluation and management of pertinent conditions that are handled on an out-patient basis.
2. Learn to function efficiently under strict time constraints.
3. Learn to organize an out-patient work up including perform appropriate out-patient diagnostic and therapeutic procedures.
4. Learn to operate as out-patient consultant communicating with telephone and letter with referring physicians appropriate. Also to follow through, collate and synthesize diagnostic data and when appropriate to review the patient.

During this rotation, the Resident will be exposed to rehabilitation of spinal injury patients, and both upper and lower extremity amputations. It is expected that during this rotation appropriate reading in areas will be undertaken, (see reading list). Rheumatology As part of this rotation the Resident will be exposed to both in-patient and out-patient rheumatologic problems. Specific attention will be focused on true rheumatologic diagnosis such as seropositive and seronegative arthritides and the syndromes that go with them. The Resident will be responsible for learning the appropriate techniques of:

1. Diagnosis.
2. Treatment.
3. Surgical referral of patient's with arthritis.

During this rotation the Resident's reading will surround:

1. Anatomy
2. Physiology
3. Pathology (responses synovium and cartilage)
4. Clinical evaluation
5. Investigate techniques
6. Pharmacology
7. Orthotic principles
8. Physical therapy

Objectives of the Orthopaedic Rotations

Orthopaedic Trauma:

Junior Resident

- ORIF volar distal radius, both bones forearm, humeral shaft, midshaft clavicle
- ORIF hip fracture (i.e. DHS or cannulated screws)
- ORIF ankle fracture
- Release of leg compartments
- IM Nailing of femur and tibia
- External Fixator application to wrist, tibia, pelvis

Senior Resident

- ORIF complex wrist fractures - includes ORIF ulnar styloid fracture
- Repair of carpal fracture-dislocations
- ORIF distal humeral fractures - includes olecranon osteotomy & fixation, total elbow arthroplasty
- Elbow dislocation repair - includes radial head replacement, lateral ligament repair
- ORIF proximal humeral fractures / fracture-dislocations - includes hemiarthroplasty
- Open reduction posterior hip dislocation
- ORIF/IM Nailing complex proximal femur fractures
- ORIF peri-articular knee fractures - includes distal femur, proximal tibia, MIPO/LISS plating
- ORIF tibial plafond fractures - includes spanning ex-fix, MIPO plating
- ORIF talus & calcaneal fractures
- ORIF Lisfranc joint injuries, metatarsal fractures

Description in more details:

MEDICAL EXPERT

Cognitive & Diagnostic

Junior Resident

a) Polytrauma patient
b) Initial ATLS management
c) Prioritization of injuries in trauma patients
d) The principles of open fracture management
e) Recognition of dysvascular limb and compartment syndrome
f) Understand the importance of pelvic fractures
g) Demonstrate knowledge of the concepts of "damage control orthopedics" vs. "early total care"
h) Isolated limb trauma
i) Principles of the management of:

    i. Fractures, dislocations and fracture dislocation with appropriate splintage
    ii. Intraarticular fracture management
    iii. Associated soft tissue injury
    iv. Compartment syndrome
    v. Dysvascular limb
    vi. Acute infection
    vii. Malunion, nonunion, late infection
    viii. Segmental bone loss

j) An understanding of associated conditions

    i. Adult respiratory distress syndrome
    ii. DVT
    iii. Fat and pulmonary embolism
    iv. Multiple organ system failure

v. Chronic regional pain syndrome
vi. Awareness and recognition of:
vii. non-accidental trauma
viii. issues related to geriatric fractures
ix. pathologic fractures

Senior Resident

a) In addition to the junior objectives, a senior resident will be expected to integrate detailed knowledge as demonstrated by an ability to formulate a comprehensive treatment plan for the traumatized patient.

b) Insufficiency fractures

Technical

Junior Resident

a) Initial management of fractures and dislocations with appropriate reduction and splinting
b) Develop competencies as a surgical assistant, knowledge of the surgical approaches, handling soft tissues and appropriate wound closures.
c) Proficiency in the use of orthopaedic equipment, and power instruments used in the management of the trauma patient.
d) Technical skills involved in ATLS protocol
e) Operative management of simple fractures – ankle, wrist, hip
f) Management of compartment syndrome and acute infection

Senior Resident

a) Should be competent in basic techniques of fracture fixation and soft tissue management including open fractures.
b) Develop competence in basic surgical procedures of the traumatic patient including operative management of single limb trauma and polytraumatic injuries including:
    i. Intramedullary nailing of long bone fractures,
    ii. Open reduction and internal fixation of diaphyseal, metaphyseal and articular fractures using standard AO techniques Techniques

of external fixation for certain injuries including: intra-articular fractures with poor soft-tissues (knee and ankle joints), pelvic fractures, distal radius fractures, knee dislocations.

iii. Open reduction of irreducible joint dislocations

iv. Planning and surgical management of malunion, nonunion and chronic infection

COMMUNICATOR

Junior Resident

a) Demonstrate skills in working with patients and families who present with communication challenges such as anger, confusion, and issues related to gender, ethnicity, cultural and religious background. This would also involve communication with those with traumatic brain injury and critical injuries.
b) Deliver information including options of care, possible complications and long term prognosis in a humane and understandable way. The resident should encourage discussion and participation in developing a treatment plan. This will lead to obtaining informed consent.
c) Demonstrate skill in communicating with other members of the trauma team and other health care personnel involved in the care of the traumatized patients.
d) Communicate effectively with appropriate consultants and synthesize their input into the care plan.
e) Clearly document the patient encounter including trauma records, progress notes, operative notes and discharge summaries.

f) The ability to obtain an appropriate informed consent for patients undergoing interventions.

Senior Resident

a) Will demonstrate the ability to deliver bad news in a humane and compassionate manner.
b) Will be able to verbally present the findings and care plan for the patient.

COLLABORATOR

Junior Resident

a) Understand the importance of the multidisciplinary trauma team and describe their roles.
b) Effectively work as a member of the trauma team both acutely and in the long term management of the trauma patient.
c) Learn to resolve interpersonal conflict.

Senior Resident

Understand community resources available to aid in the management of trauma patients and communicate effectively with those individuals or groups.

MANAGER

Junior Resident

a) Understand the importance of allocation of resources for the trauma patient and prioritize care.
b) Understand provincial trauma programs.

Senior Resident

a) Set priorities and manage time to balance patient care, educational activities and personal life
b) Understand health care funding as it relates to trauma care and the principle of cost-appropriate care.

HEALTH ADVOCATE

Junior Resident

a) Understand the life style issues and different work place environments that lead to an increased risk of trauma

b) Describe the appropriate provincial legislation relating to decreasing trauma risk

Senior Resident

a) Describe a plan to decrease the risk of trauma in their community
b) Advocate for the health of their community to include seat belt legislation, use of helmets for high risk sports and the treatment and prevention of osteoporosis.

SCHOLAR

Junior Resident

a) The resident will pose a learning question and do an appropriate literature search, they will then interpret this evidence and suggest a change in practice if necessary
b) Present an effective lecture or presentation

Senior Resident

a) Understand the principles of Continuing Professional Development
b) Understand critical appraisal and demonstrate the ability to critically review an appropriate article in the trauma literature
c) Demonstrate effective teaching techniques

PROFESSIONAL

Junior Resident

a) Describe informed consent and alternative consent givers
b) Maintain patient confidentiality and describe the limits as defined by professional practice standards and the law

Senior Resident

a) Manage any conflict of interest that arises
b) Understand and demonstrate the importance of balancing personal and professional priorities to ensure personal health and sustainable practice

Paediatric Orthopaedics:

Junior Resident

- Closed reduction technique for supracondylar fracture
- Achilles tendon release
- Hammer-toe release
- Percutaneous pinning distal radius fracture
- Closed reduction/casting fractures – forearm, tibfib, Tillaux and Triplane
- DDH hips – closed reduction/apply hip spica cast

Senior Resident

- Pinning +/- ORIF supracondylar fracture
- Complete clubfoot release technique including osteotomy of medial and lateral columns
- 1st MTP fusion
- Know technique and perform Nancy nailing of femur, forearm
- Approach and ORIF Tillaux, Triplane fractures
- DDH hips – perform and interpret arthrogram

In details:

MEDICAL EXPERT

Cognitive & Diagnostic

Junior Resident

a) Understand normal musculoskeletal anatomy, growth, and development in the child including common angular and torsional variants
b) Understand the anatomy and pathologic basis of the disorders leading to a limp in a child

c) Understands the mechanisms, patterns, assessment, management, and potential complications related to common paediatric fractures and dislocations
d) Recognition and management of common overuse syndromes
e) Recognition of non-accidental trauma and pathologic fractures
f) Demonstrate knowledge of specific surgical approaches as relates to the paediatric population
g) Understands the mechanisms, patterns, assessment, management, and potential complications related to osteomyelitis and septic arthritis
h) Understand the principles of management of children with:
    i. Common hip disorders
    ii. Common foot disorders
    iii. Angular and torsional deformities
    iv. Limb length discrepancy
i) Understand the principles of diagnosis and assessment of paediatric neoplasia
j) Interpretation of imaging and other diagnostic tools specific to the pediatric population

<u>Senior Resident</u>

a) Understand the principles of management of children with:
    i. Complex neuromuscular disease
    ii. Congenital musculoskeletal deformities
    iii. Spinal deformities
    iv. Metabolic bone disease/skeletal dysplasia
    v. Paediatric neoplasia

b) Understand mechanisms, patterns, assessment, management, and potential complications related to complex paediatric fractures and dislocations
c) Understand the anatomy, pathology, assessment, and management complex hip disorders
d) Understand the principles of management of paediatric polytrauma
e) Understand the principles of operative management of:
    i. Hip dysplasia in normal and neuromuscular patients

ii. Clubfeet
iii. Spinal deformity

Technical

Junior Resident

a) Assessment and management of simple fractures including appropriate analgesia/anesthesia techniques
b) Demonstrate proficiency in clinical examination in the following areas:
   i. Assess the limping child
   ii. The hips of infants and children including Barlow and Ortolani maneuvers
   iii. General limb length
   iv. Scoliosis examination

c) Demonstrate the ability to:
   i. Perform percutaneous pinning of fractures
   ii. Apply skin and skeletal traction
   iii. Apply a Pavlik harness

Senior Resident

a) Assessment and management of complex paediatric fractures including:
   i. Physeal injuries
   ii. Compound fractures
   iii. Multiple trauma
   iv. Compartment syndrome, and neurovascular compromise

b) Carry out non operative treatment of children's clubfoot

c) Operative management of:
   i. Septic arthritis including arthrogram and arthrotomy
   ii. Osteomyelitis
   iii. Slipped capital femoral epiphysis

d) Management of benign bone conditions
e) Perform appropriate investigation including biopsy for suspected paediatric neoplasia
f) Demonstrate the ability to apply a hip spica cast

COMMUNICATOR

a) Understands the role of communication in fostering patient satisfaction and compliance as it relates to pediatrics, parents and care givers
b) Elicits psychosocial information pertinent to the health of the patient including; socioeconomic background, ethnic, cultural, and spiritual values
c) Demonstrates the ability to deliver information to the pediatric patient and their support group in a way which is understandable
d) Understands and obtains informed consent using medical knowledge and awareness of current consent legislation
e) Demonstrate the ability to describe procedures to the pediatric patient and patient support group
f) The ability to obtain an appropriate informed consent for patients undergoing interventions.

COLLABORATOR

Junior Resident

a) Demonstrate an understanding of the unique collaborative nature of pediatric care
b) Understand and develops patient care plan with other members of the inter professional health care team
c) demonstrate the ability to work within an inter professional team in regards to research and administrative duties

Senior Resident

a) Demonstrate the ability to lead an inter professional team

b) Develop a care plan, integrate all members of the team needed and follow the plan to completion in regards to medical or nonmedical issues around the care of the pediatric orthopedic patient

MANAGER

Junior Resident

a) Access and allocate finite health care efficiently within a health care organization
b) Understand the structure, financing, and operation of the health care system and function effectively within it

Senior Resident

a) Lead the physician team and allocate manpower resources in regards patient care
b) Understand the role of the physician in regards to administrative duties in the health care
c) Demonstrate the ability to manage time allocation to inter and intra personal learning and duties

HEALTH ADVOCATE

Junior Resident

a) Recognizes and understands the psychological, social, and physical determinants of patient health
b) Understand patient advocacy issues in regards to family, care giver and social care network
c) Understands the medico legal obligations associated with non accidental trauma
d) Recognize the emotional stress for patients and families faced with orthopedic conditions and optimize psychosocial support network for the pediatric patient

Senior Resident

a) Promotion of the determinants of health in the community at large as it relates to the pediatric population
b) Demonstrate the knowledge of resources available to those patients in need of community based care
c) Understand the role of community based advocacy in regards to patients with special needs
d) Demonstrate the need to serve as a patient advocate for scarce resources for the patient with special needs

SCHOLAR

Junior Resident

a) Demonstrates ability for self-directed learning and critical appraisal of the literature
b) Demonstrate stratified level of knowledge of pediatric orthopedics with teaching of the junior members of the pediatric health care team
c) Recognize gaps in knowledge and implement a plan to improve their knowledge base

Senior Resident

a) Demonstrates the ability to resolve previously identified deficits in knowledge and technical skills
b) Identify possible areas of research in pediatric orthopedics
c) Continue to develop teaching models for patient and colleague education

PROFESSIONAL

Junior Resident

a) Demonstrates the ability to work within the scope of clinical and technical acumen and obtains responsible and timely patient referrals
b) Practice ethically consistent with the obligations of a physician and expectation of the community in regards to gender, culture, ethnicity, race, spiritual values and socioeconomic standard

c) Demonstrates the ability to put patient and parents at ease and inspire confidence in the treatment plan

Senior Resident

a) Provides efficient, authoritative consultation to the referring source
b) Serve as a role model to the junior members of the health care team in regards to a balance between professional and personal roles.
c) Understand the legislation in regards to treatment of the pediatric patient or patients otherwise unable to understand the scope of treatment needed for care
d) Demonstrates ability to identify and remediate weakness in their managerial, administrative or education skills in regards to care of the pediatric patient

Sports Medicine:

Junior Resident

- Diagnostic knee scope
- Diagnostic shoulder scope - includes establishing
- anterior portal reliably, inserting tacks/suture anchors
- Arthroscopic Subacromial Bursectomy
- Arthroscopic Acromioplasty
- Mini-open exposure and repair of Rotator Cuff tear
- Deltopectoral approach to shoulder

Senior Resident

- Arthroscopic ACL reconstruction - includes drilling tunnels, graft harvest and graft fixation
- Arthroscopic shoulder surgery - includes passing sutures through tissue arthroscopically, tying knots
- Open Bankart repair
- Tibial tubercle transfer

- High tibial osteotomy (opening or closing wedge)

In More details:

MEDICAL EXPERT

Junior Resident

a) Understand the anatomy and pathophysiology of acute and chronic Soft Tissue Injury:
    i. Rotator Cuff and Elbow Tendinopathy
    ii. Low back pain
    iii. Groin injury (Tendinopathy)
    iv. Isolated Knee Ligaments
    v. Meniscal injuries of the knee
    vi. Patellofemoral Disorders
    vii. Ankle Sprain
    viii. Achilles tendon

b) Understand the anatomy, pathophysiology and assessment of:
    i. Articular Cartilage Injury
    ii. Upper and lower extremity joint instability

Senior Resident

a) Understand the anatomy, pathophysiology, assessment and management of acute and chronic soft tissue injury and instability:
    i. Complex/revision knee ligaments
    ii. Lower extremity malalignment
    iii. Multidirectional shoulder instability
    iv. Failed shoulder reconstruction
    v. Chronic instability of the elbow
    vi. Chronic ankle instability

b) Understand the management of Articular Cartilage Injury including osteochondritis

c) Understand the principles of rehabilitation including return to sports and non-operative management including gender related issues

Technical

Junior Resident

a) Performance of appropriate upper and lower extremity physical examinations
b) Performance of diagnostic and therapeutic joint injections
c) Perform diagnostic arthroscopy of the knee and shoulder
d) Repair of simple tendon rupture

Senior Resident

Performance of:

a) Diagnostic and operative shoulder, knee and ankle arthroscopy
b) ACL reconstruction
c) Ankle ligament reconstruction
d) Patella realignment
e) Lower extremity realignment
f) Shoulder reconstruction for instability
g) Surgical management of rotator cuff pathology
h) Repair of complex tendon rupture

COMMUNICATOR

a) Ability to communicate to patients in clear and straightforward manner
b) The ability to obtain an appropriate informed consent for patients undergoing interventions.

COLLABORATOR

a) Be able to interact within the medical team efficiently and to consult effectively.

b) Delegate effectively to other members of the health care team
c) Communication with allied health professionals (physiotherapists, nurses, trainers)
d) Ability to communicate in writing appropriate rehabilitation prescriptions

MANAGER

a) Cost effective use of investigative tools and therapeutic modalities including complementary and alternative therapies and procedures
b) Effective time management for patient care and lifestyle balance

HEALTH ADVOCATE

a) Identify and advise on risk factors for prevention of injury including issues specific for gender, age and return to activity
b) Counsel athletes on the risks and side effects of performance enhancing drugs and substance abuse.

SCHOLAR

Ability to teach and supervise patients, students, colleagues and other healthcare professionals

PROFESSIONAL

Sensitivity and respect for diversity of age, gender, religion, culture and the elite athlete

Upper Extremity:

Junior Resident

- Deltopectoral approach
- Posterior elbow exposure
- Includes exposure of ulnar nerve

- Volar Henry approach to wrist/scaphoid
- Dorsal approach to wrist
- Diagnostic shoulder arthroscopy — includes bursectomy, acromioplasty
- Open/Mini-open rotator cuff repair
- Tennis elbow release/resection & repair of tissue
- Ulnar shortening osteotomy
- Darrach procedure

Senior Resident

- Diagnostic elbow & wrist arthroscopy
- Shoulder replacement - includes preparation and placement of humeral component (+/-glenoid component)
- Open Bankart repair
- Elbow replacement
- Distal biceps repairs
- Radial head replacement
- Wrist fusions - Total and partial (4-corner,
- Scaphocapitate)
- Scapholunate ligament repairs / Blatt procedure
- ORIF scaphoid fracture / nonunion
- LRTI procedure
- DRUJ stabilization procedures (i.e. Adams procedure)

In more Details:

MEDICAL EXPERT

Upon completion of the Upper Limb Rotation, the resident shall have knowledge, comprehension, problem-solving abilities and evaluation skills for the following:

Junior Resident

a) Common upper limb fractures and dislocations.

b) Degenerative, overuse and traumatic tendon injuries
c) Principles and indications for joint reconstruction of the upper limb
d) Peripheral nerve injuries, entrapments, and chronic regional pain syndromes
e) Infections including those specific to the hand
f) Compartment syndromes
g) Common vascular, inflammatory and congenital conditions
h) Ganglions and neoplasms
i) Splinting and rehabilitation
j) Principles and indications for arthroscopy in the shoulder

Senior Resident

a) Complex upper limb fractures and dislocations.
b) Complex peri-articular fractures and fracture-dislocations
c) DRUJ and carpal instabilities
d) Brachial plexus and tendon transfers
e) Principles and indications for arthroscopy in the elbow and wrist
f) Joint contractures including Dupuytren's
g) Principles of amputations and arthrodesis
h) Unique principles of treatment of skeletal metastases

Technical

Junior Resident

a) Diagnostic and therapeutic injections to the upper limb
b) Closed and open reduction techniques for common upper limb fractures and dislocations
c) Common surgical exposures to the upper limb
d) Surgical management of:
    i. Compartment syndromes

Senior Resident

a) Management of intra-articular and periprosthetic fractures of the upper limb
b) Management of scaphoid non-union
c) Corrective osteotomy of the distal radius
d) Tendon rupture repair and reconstruction
e) Joint Instabilities
f) Open/Arthroscopic Shoulder Stabilization
g) Stabilization techniques for elbow or carpal dissociations
h) Arthroplasty
i) Arthroscopy of the upper limb
j) Loose body removal
k) Arthrodeses:
l) Treatment of joint contractures:
m) Amputations – traumatic and elective

Adult Spine:

Junior (PGY1&2)

Neurological:

-Know the motor and sensory distribution of the major roots (C4-8 and L2-S4) and how to examine for them
-Understand the straight-leg raising test and what it means - limitations, accuracy
-Know basic long tract signs and what they mean (Hoffman's, Babinski, clonus)
-Understand the concept of sacral sparing in trauma
-Understand the concept of postoperative reinnervation dysesthesia

Biomechanics:

-Understand basics of loading and kinetics in the C/T/L-spine – anterior/posterior column, disc, and constraint
-Understand "creep" in soft tissue mechanics

Behavior:

-Understand the differences between disease, pain and disability
-Understand the concept of secondary gain
-Know Waddell's criteria and their significance

Surgery:

-Describe anatomic landmarks and technique for common approaches – A/P neck, posterior thoracic, posterior lumbar
-Discuss issues of capillary closing pressure, retraction, muscle perfusion/injury
-Discuss landmarks for targeting cervical lateral mass and lumbar pedicle screws
-Describe technique of graft harvest and performance of fusion

Trauma:

-Understand Denis' 3-column spine concept and his 6-types injury classification
-Understand McAffee's concept of the stable burst fracture
-Understand Ben Allen's mechanistic concept of C-spine trauma
-Understand placement of cervical traction tongs, reduction maneuvers for neck
-Discuss high-dose steroids and why/why not

Degenerative – Neck:

-Clinical syndromes – cord, root(s), pain, whiplash
-Natural history of these syndromes
-Nonoperative care
-Anterior/posterior treatment options
-Role/outcomes/limitations of fusion and/versus arthroplasty

Degenerative – Thoracolumbar:

-Clinical syndromes – cord, root(s), pain
-Natural history of these syndromes
-Nonoperative care
-Anterior/posterior treatment options
-Role/outcomes/limitations of fusion and/versus arthroplasty

Tumour / Infection:

-Common presentation of primary/secondary spine tumors
-Workup for unknown primary
-Local and systemic staging
-Imaging differences – infection versus tumor

Senior (PGY 3/4/5)

Neurological:

-Understand the bulbocavernosus reflex and its importance, normal/abnormal
-Be able to describe a complete ASIA assessment examination
-Understand the spectrum of cauda equine syndrome and issues in timing/urgency

Biomechanics:

-Understand loading behavior/limitations of anterior/posterior spine constructs
-Discuss strategies to optimize screw fixation strength

Behavior:

-Distinguish somatic/neuropathic pain, allodynia
-Perioperative pain control/narcotics use-and-abuse, multimodality, habituation versus addiction, weaning

Surgery:

-Perform common approaches (A/P neck, posterior thoracic/lumbar) safely
-Landmark and describe anterior T/L approaches
-Describe the prespinal vascular and neuroanatomy at low lumbar levels
-Safely insert cervical lateral mass and lumbar pedicle screws
-Discuss technique for odontoid and C1/2 screws, thoracic pedicle screws, anterior screw fixation in the C/T/L spine

Trauma:

-Plan and do implant constructs for common injuries
-Discus issues in timing versus prognosis for neurological recovery
-Discuss issues in timing of surgery for thoracolumbar ORIF in polytrauma

Degenerative - Neck

-Perform most of the procedure in common cases

Degenerative – Thoracolumbar:

-Perform most of the procedure in common cases

Tumour / Infection:

-How to treat
-Indications for surgery

Scoliosis:

-Management of congenital scoliosis
-Indications for anterior versus posterior, combined, staging
-Plan common constructs – anterior, posterior

-Peri-operative management – adolescent, adult

Foot and Ankle:

MEDICAL EXPERT

Junior Resident

a) Understanding of normal and abnormal gait.
b) Understanding and assessment of deformities of forefoot, midfoot, hindfoot and ankle
c) Understanding and recognition of feet at high risk for ulceration, and the presence of ulcers
d) Understand appropriate use of diagnostic imaging and tests for assessment of foot and ankle pain and deformity

e) Understand non-operative management of common foot and ankle pathology
f) Understand the assessment and diagnosis of soft tissue and bony injuries to the foot and ankle

Senior Resident

a) Understand, assess, provide a differential diagnosis and management of common foot and ankle pathologies
b) Understand and prescribe appropriate rehabilitation and non-operative management of common foot and ankle pathologies

Technical

Junior Resident

a) Performance of local anesthetic blocks for foot and ankle surgery
b) Describe common surgical approaches for hindfoot, midfoot, forefoot and ankle.
c) Perform diagnostic and therapeutic injections of foot and ankle joints
d) Initial management of diabetic/Charcot foot
e) Initial management of ischemic/gangrenous foot
f) Performance of:
    i. Simple forefoot reconstruction
    ii. Simple foot and ankle fractures

Senior Resident

a) The understanding, assessment and treatment of arthritis involving ankle, subtalar, midfoot and forefoot joints
b) The understanding, assessment and treatment of:

    i. Foot and ankle tendinopathies
    ii. Complex foot and ankle fractures
    iii. Complex forefoot reconstruction
    iv. Diagnostic and operative ankle arthroscopy

v. Complications of foot and ankle surgery
vi. Definitive management of ischemic/gangrenous foot
vii. Definitive management of diabetic/Charcot foot

Adult Arthroplasty:

MEDICAL EXPERT

Junior Resident

a) Be able to advise patients regarding the non-operative management of hip and knee arthritis; including indications, complications and effectiveness of such treatment
b) Understand the indications, results and complications of surgery for hip and knee arthritis with respect to age, gender and activity level.
c) Understand the principles of hip and knee reconstructive surgery for arthritis including osteotomy, arthrodesis and joint replacement
d) Understand the recovery and rehabilitation following hip and knee replacement
e) Understand the unique medical problems of the geriatric population

Senior Resident

a) Be competent in recognizing and assessing painful or failed hip and knee replacements, particularly with respect to infection
b) Understand the details of hip and knee reconstructive surgery for arthritis including osteotomy, arthrodesis and joint replacement
c) Understand the assessment, treatment and sequelae of complications associated with hip and knee reconstructive surgery
d) Demonstrate detailed knowledge of the following areas:
    i. Complicated primary joint arthroplasty (eg dysplatic hip, valgus knee)
    ii. Revision hip and knee replacement surgery
    iii. Selection of appropriate implants

iv. The factors affecting implant survivorship and function, including design, biomaterials, fixation and wear properties

Technical

Junior Resident

Demonstrate proficiency in the following areas:

i. Perform arthrotomies and aspirations of the hip and knee

ii. Pre-operatively plan and perform simple primary hip and knee arthroplasty with guidance

iii. Recognize and manage common post-operative complications in hip and knee reconstruction surgery

Senior Resident

Demonstrate proficiency in the following areas:

i. Performing a difficult primary hip and knee replacement

ii. Pre-operatively plan and perform simple revision hip and knee replacements

iii. Perform osteotomies around the knee

Orthopaedic Oncology:

MEDICAL EXPERT

Junior/Senior Resident

a) Obtain appropriate history and perform physical examination relating to a tumour and be competent in assessing the following:

i. Size of the tumour and its relationship to Fascia
ii. Neurovascular and articular involvement
iii. Lymphatic involvement
iv. Sites of metastatic potential for primary MSK tumours
v. Organs systems likely to metastasize to the MSK system

b) Describe the different tumour classes and their behaviour:
i. Primary lesions
ii. Benign
iii. Benign Aggressive
iv. Malignant
v. Metastatic lesions

c) Describe the presentation, radiologic characteristics and natural history of the most common primary bone tumour types:
i. Chondroid lesions
ii. Osteoid lesions
iii. Fibrous lesions
iv. Others- unicameral bone cyst, hemangioma, histiocytosis, lipoma, eosinophilic granuloma, giant cell tumour, aneurysmal bone cyst, ewings sarcoma, adamantinoma, chordoma, hemangiopericytoma

d) Describe the presentation, radiologic characteristics and natural history of different primary soft tissue tumour types:
i. Fibrous lesions
ii. Lipoid lesions
iii. Muscle lesions
iv. Vascular lesions
v. Nerve lesions

e) For a given MSK tumour:

i. Formulate a differential diagnosis and stage the tumour (according to the Enneking Musculoskeletal Tumour Society (MSTS) System)
ii. Describe the appropriate biopsy principles of MSK tumours.
iii. Formulate a treatment plan for the different tumour types
    a. surgery.

Technical

Junior/Senior Resident

To be able to perform with proficiency:

i. Open biopsy of bone and/or soft-tissue lesion
ii. Stabilization of metastatic disease
iii. Treatment of common benign tumours