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FACULTY OF POSTGRADUATE MEDICINE

DOCTOR OF MEDICINE (MD)
CURRICULUM
EMERGENCY MEDICINE (2018)

Khesar Gyalpo University of Medical Sciences of Bhutan

BACKGROUND

The Emergency Medicine (EM) residency in Bhutan is organized under the auspices of Faculty of Postgraduate Medicine of Khesar Gyalpo University of Medical Sciences of Bhutan (KGUMSB). This 4-year post-graduate residency program will have Jigme Dorji Wangchuck National Referral Hospital (JDWNRH) as the primary educational location with the Emergency Medicine Specialists as the primary educators.

The primary location for the Emergency Medicine residency training will be Jigme Dorji Wangchuck National Referral Hospital (JDWNRH). While working in the Emergency Department, the residents will have continuous direct supervision by the Emergency Medicine Specialists and teaching faculty as well as visiting international academic faculty. Additional rotations in the Gelephu Hospital or other district hospitals will be based on the availability of Emergency Medicine specialist faculty at that institution. While on off-service rotations, the residents will be supervised by the specialist faculty of each department and their rotation will be overseen by the respective course coordinators for those Departments.

The curriculum is structured over 4 years to give residents adequate clinical experience with graded responsibility so that as a fourth year they will be able to function largely independently and competently. The residents will be assessed using a model of objective, continuous, and summative assessments through the use of core competency domains in a structured competency-based medical education program as guided by KGUMSB. This will include residents maintaining a logbook of all educational activities and procedures done, regular multi-modal assessments and meetings with faculty. Ultimately the resident will have to complete a thesis, quality improvement project and final exam prior to successful completion of the Emergency Medicine residency program.

RATIONALE

As a mountainous country with significant and gradually improving transportation needs, the establishment of Emergency Medicine Centers within Bhutan is critical to improving access to appropriate medical care. Recently established at JDWNRH, Emergency Medicine, through the formation of this residency program will gradually be able to spread to the regional referral hospitals to allow for timely necessary medical care. The graduates of the Emergency Medicine Residency will be able to help better establish Emergency Medicine as a specialty within Bhutan and help proliferate an improved level of medical care.

GOALS

The primary goal of the Emergency Medicine residency is to produce knowledgeable, skilled, professional, compassionate specialists in the field of Emergency Medicine. To produce graduates dedicated to providing the highest quality medical care to the people in Bhutan and improving access to medical care as leaders in the field through education and further improvement of the country's Emergency Medical Response System.

Mission Statement

The Emergency Medicine Residency program is dedicated to providing the highest quality education for the professional development of Emergency Medicine Specialists in Bhutan. Over the course of training, the Emergency Medicine trainee will develop both the knowledge and skills necessary for the prevention, diagnosis, and management of all acute and urgent aspects of illness and injury. The Emergency Medicine Specialist will be able to provide the highest quality medical care delivered with compassion and respect to all patients of any age group and background with the full spectrum of disorders. Our goal is to train scholarly professional physicians who, as health advocates, will be outstanding clinicians, teachers and leaders in the further development of pre-hospital and in-hospital emergency medical systems in Bhutan.

AN OVERVIEW OF ROTATIONAL SCHEDULE

Residency divided into 4 years & 8 terms/semesters: July to December & January to June

Emergency Medicine Residency Curriculum

(4 weeks blocks x 13/year)

Block	1	2	3	4	5	6	7	8	9	10	11	12	13
Year 1 2 terms	EM	Anesthesia	Orthopedics	Pediatrics - Wards - OPD	Radiology	Ophthalmology	OB/GYN	ICU	Internal Medicine	EM	EM	EM & EMS	Elective
Year 2 2 terms	EM	EM	EM	EM	EM	EM	ICU	PICU	NICU	IM Sub: - Cards - GI	Surgery: -Neuro -Trauma	ENT & Research	Elective
Year 3 2 terms	EM	EM	EM	EM	EM	EM	ICU	PICU & NICU	Research	EM: Gelephu	EM & Admin	Elective	Elective
Year 4 2 terms	EM	EM	EM	EM	EM	EM	EM	ICU	QI & Admin	EM & Research	EM: Gelephu	Elective	Elective

*Order of Rotations/Timing of Blocks May be changed based on scheduling requirements

Term: July to December and January to June (6 months), 4 years is divided into 8 terms.

***: refer the section on assessment system for further details

CORE COMPETENCY DOMAINS

The Core Competency shall comprise of the following:
The physician who completes the training is a specialist in Emergency Medicine and gain the minimum knowledge and ability according to the core competencies in six areas.

PATIENT CARE and PROCEDURAL SKILLS:

PATIENT CARE

Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health
Residents Must Demonstrate Proficiency in:

- synthesizing essential data necessary for the correct management of a patient with multiple chronic medical problems and, when appropriate, comparing with a prior medical record and identifying significant differences between the current presentation and past presentations
- generating an appropriate differential diagnosis applying the results of diagnostic testing based on the probability of disease and the likelihood of test results altering management
- narrowing and prioritizing the list of weighted differential diagnoses to determine appropriate management based on all of the available data
- implementing an effective patient management plan
- selecting and prescribing appropriate pharmaceutical agents based upon relevant considerations, such as: allergies; clinical guidelines; intended effect; financial considerations; institutional policies; mechanism of action; patient preferences; possible adverse effects; and potential drug-food and drug-drug interactions; and effectively combining agents and monitoring and intervening in the advent of adverse effects in the emergency department
- progressing along a continuum of managing a single patient, to managing multiple patients and resources within the emergency department
- providing health care services aimed at preventing health problems or maintaining health
- working with health care professionals to provide patient-focused care
- identifying life-threatening conditions and the most likely diagnosis, synthesizing acquired patient data, and identifying how and when to access current medical information
- establishing and implementing a comprehensive disposition plan that uses appropriate consultation resources, patient education regarding diagnosis, treatment plan, medications, and time and location specific disposition instructions
- re-evaluating patients undergoing emergency department observation (and monitoring) and using appropriate data and resources, and, determining the differential diagnosis, treatment plan, and disposition

Procedural Skills:

Residents must demonstrate proficiency in:

- performing diagnostic and therapeutic procedures and emergency stabilization
- managing critically-ill and injured patients who present to the emergency department, prioritizing critical initial stabilization action, mobilizing hospital support services in the resuscitation of critically-ill or injured patients and reassessing after a stabilizing intervention
- properly sequencing critical actions for patient care and generating a differential diagnosis for an undifferentiated patient
- mobilizing and managing necessary personnel and other hospital resources to meet critical needs of multiple patients
- Performing invasive procedures, monitoring unstable patients, and directing major resuscitations of all types on all age groups.
- must perform indicated procedures on all appropriate patients, including those who are uncooperative, at the extremes of age, hemodynamically unstable and who have multiple co-morbidities, poorly defined anatomy, high risk for pain or procedural complications, or require sedation, take steps to avoid potential complications; and recognize the outcome and/or complications resulting from the procedures

Residents must demonstrate competence in performing the following key index *procedures*:

- adult medical resuscitation
- adult trauma resuscitation
- anesthesia and pain management: Residents must provide safe acute pain management, anesthesia, and procedural sedation to patients of all ages regardless of the clinical situation
- cardiac pacing
- chest tubes
- cricothyrotomy
- dislocation reduction
- emergency department bedside ULTRASOUND: Residents must use ultrasound for the bedside diagnostic evaluation of emergency medical conditions and diagnoses, resuscitation of the acutely ill or injured patient, and procedural guidance
- INTUBATIONS: Residents must perform airway management on all appropriate patients, including those who are uncooperative, at the extremes of age, hemodynamically unstable and who have multiple co-morbidities, poorly-defined anatomy, high risk for pain or procedural complications, or require sedation; take steps to avoid potential complications; and recognize the outcome and/or complications resulting from the procedure

- lumbar puncture
- pediatric medical resuscitation
- pediatric trauma resuscitation
- pericardiocentesis
- procedural sedation
- vaginal delivery
- vascular access: Residents must successfully obtain vascular access in patients of all ages regardless of the clinical situation
- wound management: Residents must assess and appropriately manage wounds in patients of all ages regardless of the clinical situation

MEDICAL KNOWLEDGE

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social- behavioral sciences, as well as the application of this knowledge to patient care.

Residents:

- must demonstrate appropriate medical knowledge in the care of emergency medicine patients
- must demonstrate knowledge of the scientific method of problem solving, evidence-based decision making, a commitment to lifelong learning, and an attitude of caring derived from humanistic and professional values

PRACTICE-BASED LEARNING and IMPROVEMENT

- Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.
- Residents are expected to develop skills and habits to be able to meet the following goals:
- identify strengths, deficiencies, and limits in one's knowledge and expertise
- set learning and improvement goals
- identify and perform appropriate learning activities
- systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement
- incorporate formative evaluation feedback into daily practice
- locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems

- use information technology to optimize learning
- participate in the education of patients, families, students, residents and other health professionals
- apply knowledge of study design and statistical methods to critically appraise the medical literature
- use information technology to improve patient care
- evaluate teaching effectiveness
- teach different audiences using appropriate strategies based on targeted learning objectives

INTERPERSONAL and COMMUNICATION SKILLS

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Residents are expected to:

- communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds
- communicate effectively with physicians, other health professionals, and health related agencies
- work effectively as a member or leader of a health care team or other professional group
- act in a consultative role to other physicians and health professionals
- maintain comprehensive, timely, and legible medical records, if applicable
- communicate sensitive issues or unexpected outcomes, including:
- diagnostic findings
- end-of-life issues and death
- medical errors
- lead patient care teams, ensuring effective communication and mutual respect among team members

PROFESSIONALISM

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles

Residents are expected to demonstrate:

- compassion, integrity, and respect for others
- responsiveness to patient needs that supersedes self- interest

- respect for patient privacy and autonomy
- accountability to patients, society and the profession
- sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation

SYSTEMS-BASED PRACTICE

Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.

Residents are expected to:

- work effectively in various health care delivery settings and systems relevant to their clinical specialty
- coordinate patient care within the health care system relevant to their clinical specialty
- incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population- based care as appropriate
- advocate for quality patient care and optimal patient care systems
- work in inter-professional teams to enhance patient safety and improve patient care quality
- participate in identifying system errors and implementing potential systems solutions
- participate in performance improvement to optimize self- learning, emergency department function, and patient safety
- use technology to accomplish and document safe health care delivery

EDUCATIONAL STRETEGIES

TEACHING AND LEARNING ACTIVITIES

Below are the teaching and learning activities that will provide the foundation for acquisition of the essential knowledge and skills to be an effective Emergency Specialist.

Educational Didactics - every Wednesday morning there will be a 3-hour learning session which will include a combination of learning methods to include:

- Lectures on Core Topics - by Faculty and Residents
- Small group case discussions
- Morbidity and Mortality Conference
- Journal Watch

Resident Lectures - regular responsibility for lecturing during residency will come in 2 forms:

- annually - every resident present 2 lectures on a core topic
- during 2nd-4th resident to make 2 case presentations

Bedside Teaching - compromises the primary method of daily learning which will occur with daily patient encounters and in Emergency Department (ED) rounds which will occur with every shift change

Simulation and Procedure Labs - this will include practicing and running medical, pediatric and trauma resuscitation code in simulation lab. Procedure Labs will constitute dedicated procedural practice time on mannikins, etc

Ultrasound Lab - a biannual course will be held with healthy volunteers for the residents to become familiar with and optimize their technique and interpretation of point-of-care ultrasound (POCUS) and ultrasound guided procedures

Journal Club - monthly discussion and analysis of current Emergency Medicine scientific articles - to be used for clinical learning as well as to provide a foundation in statistics, scientific methodology and evaluation of the medical literature

Follow-Up Conference - quarterly short format case reports to highlight teaching pearls found in daily clinical practice

Teaching - Residents will have an increasing role in the Department teaching and supervising interns and junior residents on clinical bedside teaching and procedures, this will include a formative role during a dedicated teaching month as a senior resident

Resident Projects

- **Thesis -** every resident will have to formulate a research question, conduct a study, analyze, discuss and write-up the findings.
- **Clinical Case Write Up -** each resident will be required to write up one clinical case for publication.
- **Quality Improvement Project -** senior residents will have to complete a quality improvement project to improve the clinical care provided in the ED.

METHODS OF ASSESSMENT AND ASSESSMENT STRUCTURE

Assessment of Resident learning and progression can be divided into 3 broad categories.

Objective:

- Written exams
- OSCE
- Thesis presentation

Continuous:

- In-Training Rotation Evaluations
- CBD: Case Based Discussion Evaluation
- Mini CEx: Mini Clinical Evaluation
- EM 360 Degree Feedback Evaluation
- DOPS: Direct Observation of Procedural Skills Evaluation
- LogBook

Summative:

- Semi-Annual Meeting with Course Coordinators to review feedback, progress, make learning goals, and learning plan
- Portfolio

The Emergency Medicine residents will meet with the Course Coordinator every 6 months to discuss their progress, challenges and goals to foster a supportive and communicative mentoring relationship towards the success of each resident.

Assessment is a strong driving force behind learning and therefore is a main focus in the curriculum design. Since it addresses complex competencies, it requires both quantitative and qualitative information from different sources as well as professional judgement. No single assessment method is inferior or superior and all methods have their strengths and weaknesses. Our complete assessment program tries to balance these out. The following methods will be utilized for both formative and summative assessments:

Objective:

Written exams:

a) The Short Answer Question (SAQ)

This is an open ended, semi-structured question format. They take more time to answer than for example multiple choice questions and therefore their reliability per hour of testing time is lower. Generally, it is recommended that they should be used mainly

when testing aspects which cannot be tested by closed questions format. A structured predetermined marking scheme improves reliability.

b) Multiple Choice Questions (MCQ)

MCQ tests can be useful for formative and summative assessments and good quality MCQ can be set through peer review process and efficient feedback system. Although time consuming to set, these tests typically have a high reliability per hour of testing time (than open ended questions), because they can easily mitigate the impact of context specificity, i.e. a large number of items can be tested and marked within a relatively short time frame.

C) Key Feature Questions (KFQ)

This is a clinical scenario-based question. A description of the cases is followed by a limited number of questions that focus on critical, challenging actions or decisions.

Objective Structured Clinical examination (OSCE)

This consists of multiple stations in each of which the candidate is asked to perform a different defined task such as taking a focused history or performing a focused clinical examination of a particular system. A standardized marking scheme specific for each case is used.

- Thesis presentation

Continuous:

- **In-Training Rotation Evaluations**

  This is a snapshot, used to form a summative picture of the residents regular functioning. An overview of the Resident's progress through the core competencies and milestones as assessed by Faculty.

- **CBD: Case Based Discussion Evaluation**

  This is a valuable workplace formative assessment tool and is used to assess the resident's professional judgments in clinical areas. In this method, a comprehensive review of a clinical case is conducted between a resident and an assessor. After the discussion, the assessor provides feedback to help the resident improve and structure their future learning. The clinical areas that can be assessed by these methods are record keeping, history taking, clinical findings and interpretation, management plan, follow up and future planning.

- **Mini CEx: Mini Clinical Evaluation**

  The Mini-CEX is a 10 to 20 minutes direct observation assessment or "snapshot" of a trainee-patient interaction. The competencies that can be assessed by this method are: patient's history taking, physical examination, counseling skills, Clinical Judgment/reasoning and overall clinical competence.

- **EM 360 Degree Feedback Evaluation**

  360-Degree Evaluation/Multi-source Assessment consists of measurement tools completed by multiple individuals in a person's sphere of influence. Assessment by peers, other members of the clinical team, and patients can provide insight into trainees' work habits, capacity for team work, and interpersonal sensitivity.

- **DOPS: Direct Observation of Procedural Skills Evaluation**

  This is a structured rating scale for assessing and providing feedback on practical procedures. The competencies that are commonly assessed include general knowledge about the procedure, informed consent, pre-procedure preparation, analgesia, technical ability, aseptic technique, post-procedure management, and counseling and communication.

- **LogBook**

  In the Logbook students keep a record of the patients seen or procedures performed- ideally in computerized form. It documents the range of patient care and learning experience of students. Logbook is very useful in focusing students on important objectives that must be fulfilled within a specified period of time. It is most important to document procedures performed or specialized trainings attended

SUMMATIVE:

- **Portfolio assessment**

  This method is the most important process that will be utilized to assess Emergency Medicine residents. They are required to collect every bit of learning experience and data like a logbook, reflections and all records of learning activity and assessments reflecting six domains of Emergency Medicine, throughout the training period. It will be seen as both the process and the outcome of the Emergency Medicine residency program. As a process, it will enable the residents to monitor their own learning systematically, reflecting on their learning using the six domains of Emergency Medicine leading to learning goals. As a product, it holds the work records and documents the resident has produced representing their achievements. The portfolio will be assessed regularly by the residents and the Emergency Medicine Residency Coordinator.

DETAILS OF CORE COMPETENCIES WITH LEARNING METHODS AND TOOLS OF ASSESSMENT

PATIENT CARE

I. Patient Care and Procedural Skills	Learning Methods	Assessment
Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.	-Procedure Labs -Simulation Sessions -Didactic Lecture -Clinical Shift Teaching -Standardized Exam Life Support Course Chart Review	Objective : - OSCE Continuous: - In-Training Evaluations - CBD: Case Based Discussions - Mini CEx - Procedure Evaluations: DOPS - Log book Chart Review Semi-Annual Summative Meeting with Course Coordinator

APPLIED PROFESSIONAL KNOWLEDGE AND SKILL

II. Medical Knowledge	Learning Methods	Assessment
Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioral sciences, as well as the application of this knowledge to patient care.	Didactic Lectures : —> Journal Club —>Case Conference —>M&M conference Simulation Self-Directed Learning Clinical Bedside Teaching Peer Teaching Clinical Conferences	Objective : -Written Exam -OSCE Continuous: - In-Training Evaluations - Mini CEx CBD: Case Based Discussion - Semi-Annual Summative Meeting with Course Coordinator

PRACTICE-BASED LEARNING AND IMPROVEMENT

III. Practice-based Learning and Improvement	Learning Methods	Assessment
Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning Residents are expected to develop skills and habits to be able to meet the following goals	-Didactic Teaching —> Journal Club - Participation and Presentation —-> Morbidity and Mortality - Participation and Presentation —> Case Conference - Participation and Presentation -Scholarly Article and Thesis - Mentorship of Writing -Senior Administrative Project - Quality Improvement - Clinical Bedside Teaching	Objective: - OSCE - Thesis CbD Logbook Continuous: - Portfolio - Self Assessment - Chart Review - In-Training Evaluation/ Encounter Cards - Peer Review - Semi-Annual Summative Meeting with Course Coordinator

INTERPERSONAL AND COMMUNICATION SKILLS

IV. Interpersonal / Communication Skills	Learning Methods	Assessment
Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.	Role Modeling Simulation and Role Play Didactic Lectures - breaking bad news; end of life; medical errors Self-Learning and Reflection	Objective OSCE Continuous: Global 360 In-Training Evaluation Self-Assessment - Semi-Annual Summative Meeting with Course Coordinator

SYSTEMS-BASED PRACTICE

V. Systems-based Practice	Learning Methods	Assessment
Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.	- Rotations in: Different Settings, EMS, Administration -Didactics - Role Modeling	Objective: OSCE Continuous: In Training Evaluation Global 360 Portfolio - Semi-Annual Summative Meeting with Course Coordinator

PROFESSIONALISM

VI. Professionalism	**Learning Methods**	**Assessment**
Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles	Role Modeling and Mentoring Standardized Exam - Simulation	Objective: OSCE Continuous: Self-Assessment In-training Evaluation Mini CEx Case Discussion Portfolio Global 360 - Semi-Annual Summative Meeting with Course Coordinator

INTRODUCTION TO CONTENTS

GENERIC CURRICULUM

The Generic Curriculum or basic science for the first 6 months is designed to help resident doctors to develop competency in a number of areas including communication and consultation skills, patient safety and team work as well as the general principles and techniques of basic sciences including diagnostic and imaging and investigative medicine. The resident doctors are also expected to develop and demonstrate a range of essential interpersonal and clinical skills for managing both acute and long-term conditions, regardless of the specialty. The concepts defined in the Generic Curriculum should continue to be visited, reflected upon, and honed throughout the residency training programme and lifelong professional carrier.

Learning outcomes

At the end of this curriculum, the residents are expected to be able to:

- Identify the general and specific learning needs and outcome of the whole residency programme.
- Apply the principles and techniques in basic sciences to clinical setting in the respective Specialty discipline.
- Synthesize the process of history taking, clinical observations, investigations, diagnosis and treatment plans for proper and effective management of the patients.
- Illustrate a range of essential interpersonal and clinical skills for managing patients with both acute and long-term conditions, regardless of the specialty.
- Demonstrate different aspects of medical ethics and etiquettes for strengthening professionalism and patient care.
- Identify and address the legal and ethical issues as applicable to clinical practice and healthcare.
- Provide leadership and management oversight in patient management with emphasis on intra-and inter-disciplinary team work.
- Make independent clinical decisions with appropriate support.
- Understand the principles and techniques in epidemiology, biostatics and research and apply research in clinical practice to promote and strengthen evidence-based care.

TEACHING METHODS MODULE

MEDICAL HUMANITIES MODULE

Note: Above two modules will be delivered from term 2 to term 7 residency with compulsory attendance requirement of 90% to qualify for institute examination III.

QUALITY IMPROVEMENT PROJECT

CLINICAL COURSE CONTENTS

First Year Resident

Knowledge

- Express knowledge of the biochemical, clinical, epidemiologic, and social behavioral basis of diseases seen in the emergency department.
- Demonstrate an understanding of the concepts of disease prevention as it applies to emergency medicine.
- Possess a basic understanding of statistics and the principles of evidence-based medicine.

Skills

- Provide appropriate care to patients with **non-emergent conditions**.
  1. Obtain an accurate clinical and psychosocial history.
  2. Perform a comprehensive physical examination.
  3. Develop appropriate differential diagnoses.
  4. Be aware of appropriate investigative and therapeutic options.
  5. Implement an appropriate written and verbal discharge plan.
  6. Demonstrate an awareness of the available information systems to support patient care and discharge planning.
- Become skilled in the core procedures for non-emergent conditions including techniques, indications & contra-indications (eg, laceration repair, reduction in or immobilization of extremity injury, pelvic examination, slit-lamp examination).
- Learn proper medical documentation of patient historical, physical examination, and diagnostic test findings.
- Obtain a mastery of the principles of ACLS, PALS and ATLS.
- Demonstrate effective interpersonal and communication skills with patients, their families, other physicians and health care providers
- Embody the professionalism required of a physician respecting patients' privacy and autonomy, demonstrating sensitivity to patients' varied backgrounds and responsibility to ethical principles in the care of the patient.
- Demonstrate a basic understanding of the role of the emergency department in the larger context of health care delivery.
- Serve as an advocate for the patient in their dealing with the complexities of the health care system.

Rotations: (4-week blocks x 13 blocks/year)

- **EM Introduction** - 1 block (4 weeks)
- **Anesthesia - 1 block (4 weeks)**
- **Orthopedics - 1 block (4 weeks)**
- **Pediatrics split:** 1 block (4 weeks)
  a) Wards - 2 weeks
  b) OPD - 2 weeks
- **Radiology - 1 block (4 weeks)**
- **Ophthalmology - 1 block (4 weeks)**
- **Obstetrics and Gynecology - 1 block (4 weeks)**
- **ICU - Adult Critical Care - 1 block (4 weeks)**
- **Internal Medicine wards - 1 block (4 weeks)**
- **EM - Emergency Department** - 1 blocks (4 weeks)
  a) Acute Medical Care (AMC) Room

b) Minor Procedure Room

- **EM - Emergency Department - 1 blocks (4 weeks)**
- **EM & Prehospital (Ambulance) - 1 block (4 weeks)**
- **Elective & Conferences** - 1 block (4 weeks)

Second Year Resident

In addition to the objectives from the prior year

Knowledge

- Demonstrate a level-appropriate knowledge of the biochemical, clinical, epidemiologic, and social-behavioral basis of diseases seen in the emergency department.
- Demonstrate an understanding of the core curriculum.
- Possess a basic understanding of the principles of evidence-based medicine & gain the ability to appraise scientific evidence and published studies.

Skills

- Provide appropriate care to patients with emergent & life-threatening conditions:
  a) Obtain focused & accurate history & physical examination.
  b) Develop comprehensive differential diagnoses.
  c) Implement an investigative & therapeutic plan.
  d) Implement an appropriate written and verbal discharge plan.
- Become skilled in the core procedures used on patients with emergent and life-threatening conditions (eg, endotracheal intubation, tube thoracostomy, defibrillation/cardioversion, etc.)
- Apply the principles of evidence-based medicine.
- Demonstrate the ability to appraise and assimilate scientific evidence and implement it to improve their own practice.
- Demonstrate the ability to critically assess their competency in managing the emergent and life-threatening conditions.
- Demonstrate a level-appropriate understanding of the role of the emergency department in the larger context of health care delivery.
- Demonstrate the ability to divide his or her time and energies appropriately to provide optimal care for several patients concurrently without compromising patient care.
- Demonstrate mastery of the emergent and life-threatening conditions that present to the emergency department.

Year 2 Rotations: (4-week blocks x 13 blocks/year)

- **Emergency Department -** 6 blocks (28 weeks)
  a) Acute Medical Care (AMC)

b) Resuscitation room
c) Procedure room

- **Emergency Department**
- **Emergency Department**
- **Emergency Department**
- **Emergency Department**
- **Emergency Department**
- **Internal Medicine Sub-specialties:**

  a) Cardiology
  b) Gastroenterology

- **ICU - Adult Critical Care -** 1 block (4 weeks)
- **PICU - Pediatric Critical Care -** 1 block (4 weeks)
- **NICU - Neonatal Critical Care -** 1 block (4 weeks)
- **General Surgery -** 1 block - 4 weeks (focus: Neurosurgical & trauma management)
- **Split Block -** 1 block (2 weeks)

  a) ENT - 2 weeks
  b) Research - Thesis preparation and planning - 2 weeks
- **Elective & Conferences** - 1 block (4 weeks)

Third Year Resident

In addition to the objectives achieved during the first 2 years:

Knowledge

- Demonstrate a level-appropriate knowledge of the biochemical, clinical, epidemiologic, and social-behavioral basis of diseases seen in the emergency department.
- Demonstrate an understanding of the core curriculum.
- Demonstrate an understanding of the role of the emergency department in the larger context of health care delivery.
- Process an understanding of the principles of evidence-based medicine & the ability to appraise scientific evidence and published studies.

Skills

- Provide appropriate care to patients in the whole Emergency Department including teaching:

  a) Listen to a history and physical examination presentation from a junior resident

and provide appropriate feedback and guidance.
b) Perform an appropriately focused history and physical examination, taking into consideration the previous evaluation of the junior resident
c) Implement an appropriate investigative and therapeutic plan.
d) Implement an appropriate written and verbal discharge plan.

- Demonstrate understanding of the indications, contraindications, and techniques in uncommonly performed but lifesaving procedures (eg., cricothyrotomy, burr craniotomy) and mastery of all other core procedures.
- Facilitate the learning of others. Teach and appropriately supervise medical students and junior residents.
- Demonstrate an understanding of documentation as it applies to billing and reimbursement requirements.
- Demonstrate mastery of all conditions that commonly present to the emergency department.
- Teach courses such as ACLS as a certified instructor.
- Triage patients and direct the attention of junior-level residents so as to provide optimal care for all patients in the emergency department.

Year 3 Rotations: (4-week blocks x 13 blocks/year)

- **Emergency Department -** 6 blocks (24 weeks)
  a) Acute medical room
  b) Resuscitation room
  c) BEAR
- E**mergency Department**
- **Emergency Department**
- **Emergency Department**
- **Emergency Department**
- **Emergency Department**
- **ICU - Advanced Adult Critical Care -** 1 block (4 weeks)
- **Advanced Pediatric Critical Care** - 1 block (4 weeks)
  a) PICU - 2 weeks
  b) NICU - 2 weeks
- **Research - Thesis -** 1 block (4 weeks)
- **Emergency Medicine - Away Hospital ED: Gelephu -** 1 block (4 weeks)
- **Emergency Department Administration & Teaching -** 1 block (4 weeks)
- **Elective (see list) -** 1 block (4 weeks)
- **Elective & Conferences** - 1 block (4 weeks)

Fourth Year Resident

In addition to the objectives achieved during the first 3 years:

Knowledge

- Demonstrate a level-appropriate knowledge of the biochemical, clinical, epidemiologic, and social-behavioral basis of diseases seen in the emergency department.
- Demonstrate an understanding of the role of the emergency department in the larger context of health care delivery.
- Possess a thorough understanding of the principles of evidence-based medicine & utilize the ability to appraise scientific evidence and published studies.

Skills

- Provide appropriate care to all patients with a **focus on teaching and research to improve the quality of care** and level of knowledge in the Emergency Department including evaluating patients along with junior residents providing appropriate feedback and guidance in their patient encounter, physical exam, development of differential diagnoses, investigative, treatment and disposition plan.
- Demonstrate a mastery of all common and rare emergency medicine procedures by teaching including the indications, contraindications, and various techniques to perform and troubleshoot successful completion.
- Identify areas for improvement within the Emergency Department and complete at least 1 project creating a model, protocol or pathway towards achieving this improvement.
- Facilitate the learning of others. Teach and appropriately supervise medical students and junior residents.
- Demonstrate mastery of all conditions that commonly & uncommonly present to the emergency department.
- Teach courses such in ACLS, Primary Trauma Care, and resuscitation of different specialized populations: neonatal, pediatrics and postpartum patients.
- Triage patients and direct the attention of junior-level residents so as to provide optimal care for all patients in the emergency department.

Year 4 Rotations: (4 week blocks x 13 blocks/year)

- **Emergency Department** - 7 blocks (28 weeks)
  a) Acute medical room
  b) Resuscitation room
  c) BEAR
- **Emergency Department**
- **Emergency Department**
- **Emergency Department**
- **Emergency Department**

- **Emergency Department**
- **Emergency Department**
- **ICU** - **Advanced Adult Critical Care** - 1 block (4 weeks)
- **Quality Improvement and Administration in the Emergency Department** - 1 block (4 weeks)
- **Teaching in the Emergency Department** - 1 block (4 weeks)
- **Emergency Medicine - Away Hospital ED: Gelephu** - 1 block (4 weeks)
- **Elective** (see list or out of country) - 1 block (4 weeks)
- **Elective & Conferences -** 1 block (4 weeks)

Emergency Medicine Residency Off-Service Rotation Objectives

Rotation: Anesthesia: PGY 1
Rotation Overview:
PGY 1 Emergency Medicine (EM) Residents rotate in the Anesthesia Department at JDWNRH. This rotation follows the model of graded and progressive responsibility, and expectations of the resident are commensurate with their experience and training with senior residents carrying a greater patient load and gaining experience in more technically advanced procedures.

Evaluation and Feedback:
Written evaluations of EM residents are completed by the supervising Anesthesia attending(s) on service for that period of time. Procedures performed on this rotation are to be documented in the residents' procedure logs.

Rotation Goals:
The major goals for the Anesthesia rotations are to develop fundamental skills of airway management as they pertain to the practice of emergency medicine. This is a foundational rotation for the EM residents to gain experience and confidence in endotracheal intubation and airway adjuncts under a high level of supervision.

Rotation Objectives:
After completing the Anesthesia rotation, the EM residents will be expected to at their training level:

- Describe upper airway anatomy.
- Describe elements of airway assessment and indications impacting airway management, including predictors of a difficult airway.
- Perform basic airway maneuvers (i.e. jaw thrust/chin lift), use adjuncts (oral NP airways), and ventilate/oxygenate patients with a BVM and anesthesia bag.
- Perform endotracheal intubation without adjuncts and confirm proper tube placement using multiple modalities.

- Discuss the differences and appropriate clinical situations for the use of direct laryngoscopy (Miller and Mac blades), video laryngoscopy and LMAs.
- Describe the pharmacology of agents used for rapid sequence intubation including specific indications and contraindications.
- Professionally and effectively communicate with patients and their family members regarding airway management/intubation indications and results.
- Effectively function as part of the integrated healthcare team and being open and responsive to feedback from other team members and peers.

Rotation: Orthopedic Surgery: R 1
Rotation Overview:
PGY 1 Emergency Medicine (EM) Residents rotate on the Orthopedic Service at JDWNRH. They are to function as a full member of this team working to provide full-time orthopedic coverage for traumatic and non-traumatic orthopedic patients. This rotation follows the model of graded and progressive responsibility, and expectations of the resident are commensurate with their experience and training with senior residents carrying a greater patient load and gaining experience in more technically advanced procedures.

Evaluation and Feedback:
Written evaluations of EM residents are completed by the supervising Surgery attending(s) on service for that period of time. Procedures performed on this rotation are to be documented in the residents' procedure logs.

Rotation Goals:
The major goal of the orthopedic rotation is to gain proficiency with the evaluation and management of a wide range of traumatic and non-traumatic orthopedic conditions that may be relevant to the care of emergency department patients presenting with orthopedic complaints.

Rotation Objectives:
- Develop advanced knowledge of pertinent anatomy involved in orthopedic injury and disease.
- Accurately use proper nomenclature and terminology of orthopedic injuries and diseases to describe and communicate relevant findings to other members of the health care team as well as in the medical record.
- Demonstrate the ability to appropriately order and interpret data gathered from radiographic, laboratory, and other diagnostic modalities involved in optimal care of orthopedic pathology.
- Recognize clinical conditions that require immediate surgical and/or operative interventions i.e compartment syndrome, open fracture, joint dislocation with neurovascular compromise.

- Be able to effectively communicate pertinent findings and explain orthopedic conditions and indicated interventions effectively to patients and family members in a comprehensible, compassionate, and professional manner.
- Perform orthopedic reductions with analgesia, regional anesthesia, and/or procedural sedation.
- Perform repair of complex wounds in a fashion that minimizes complication and infection and maximizes optimal patient outcome.
- Perform common types of splint applications in orthopedic injuries.
- Understand indications for traction. Become familiar with and perform temporary traction splint placement and traction bed set-up. Incorporate constructive feedback from peers and supervisors to improve overall performance.

Rotation: Pediatric OPD & Wards: R 1

Rotation Overview:

PGY 1 Emergency Medicine (EM) Residents rotate in the Pediatric Outpatient Department & Inpatient Wards at JDWNRH for two weeks each respectively. They function as a full member of this team working under the supervision Pediatricians. This EM rotation follows the model of progressive responsibility, and PGY 1 residents carry a patient load commensurate with their ability and level of training.

Evaluation and Feedback:

Written evaluations of EM residents are completed by the supervising Anesthesia attending(s) on service for that period of time. Procedures performed on this rotation are to be documented in the residents' procedure log.

Rotation Goals:

The major goals of the PGY-1 pediatric outpatient and inpatient rotation is to gain an in-depth exposure the pediatric exam and evaluation and gain extensive experience with the management of a wide range of pediatric disease.

Rotation Objectives:

- Demonstrate appropriate history and physical examination skills for the pediatric patient.
- Be familiar with proper nomenclature and terminology used in pediatric practice.
- Demonstrate knowledge and awareness of issues unique to pediatric practice, and how these may differ from adult medicine.
- Demonstrate a thorough understanding of the pediatric pathophysiology and diagnosis of potentially ill patients with shock, sepsis, fluid and electrolyte abnormalities, cardiac, renal, hepatic disease, as well as congenital syndromes and associated conditions.
- Demonstrate the ability to treat the ill pediatric patient with pharmacologically appropriate medications such as antibiotics and analgesics.

- Demonstrate the ability to appropriately prioritize, order and interpret data gathered from radiographic, laboratory, and other diagnostic modalities involved in optimal care of the child.
- Recognize acute changes in clinical status of the pediatric patient, and perform re-evaluation and resuscitation as indicated. Effectively communicate changes in status to other members of the healthcare team.
- Be able to explain medical and surgical conditions as well as indicated interventions simply and effectively in non-medical terms to pediatric patients and family in a compassionate and professional manner.
- Gain insight into the special emotional and social challenges, which the sick child poses to both the family and medical care team.
- Be able to incorporate constructive feedback from peers and supervisors to improve overall performance.

Rotation: Radiology: R 1

Rotation Overview:

PGY 1 Emergency Medicine (EM) Residents rotate in the Radiology Department at JDWNRH for 4 weeks. They function as a full member of this team working with the varied imaging modalities and specialists with a particular focus on common and emergent conditions.

Evaluation and Feedback:

Written evaluations of EM residents are completed by the supervising Radiology attending(s) on service for that period of time. Procedures including slit lamp exams performed on this rotation are to be documented in the residents' procedure logs.

Rotation Goals:

The major goals for the Ophthalmology rotation are to develop fundamental skills and confidence in the assessment and management of all common and particularly emergent ophthalmological conditions.

Rotation Objectives:

After completing the Ophthalmology rotation, the EM residents will be expected to:

- Understand the different imaging modalities and their functionality.
- Understand the appropriate indications and contraindications for imaging modalities based on patient compliant, differential diagnosis, time-sensitivity and stability.
- Read a variety of xrays including, but not limited to extremities, joints, CXRs, Abdominal, and spine.
- Read head CT with confidence.
- Have an understanding of reading remaining CT modalities.
- Understanding of emergent indications of MRI and ability to read the basics after

imaging.

- Understand the pharmacologic agents used for imaging including oral and IV contrast materials including specific indications and contraindications.
- Professionally and effectively communicate with patients and their family members regarding the findings and diagnoses.

Rotation: Ophthalmology: R 1

Rotation Overview:

PGY 1 Emergency Medicine (EM) Residents rotate in the Ophthalmology Department at JDWNRH for 4 weeks. They function as a full member of this team working to assess and treat all range of ophthalmologic conditions with a particular focus on common and emergent conditions.

Evaluation and Feedback:

Written evaluations of EM residents are completed by the supervising Ophthalmology attending(s) on service for that period of time. Procedures including slit lamp exams performed on this rotation are to be documented in the residents' procedure logs.

Rotation Goals:

The major goals for the Ophthalmology rotation are to develop fundamental skills and confidence in the assessment and management of all common and particularly emergent ophthalmological conditions.

Rotation Objectives:

After completing the Ophthalmology rotation, the EM residents will be expected to:

- Describe the anatomy of the eye and related pathologic finding comfortably.
- Perform a basic and comprehensive ophthalmologic exam including slit lamp exam, visual fields, fundoscopy as indicated by the patient complaint and condition.
- Confidently describe ophthalmologic exam findings to consultations.
- Understand the pharmacology of agents used for treatment of common conditions including specific indications and contraindications.
- Professionally and effectively communicate with patients and their family members regarding the findings and diagnoses.
- Have an understanding of common ophthalmologic conditions with an acute grasp on emergencies including, but not limited to acute angle glaucoma, open globe rupture and the time sensitivity of retinal pathology.

Rotation: Obstetrics & Gynecology (OB/GYN): R 1 & 2

Rotation Overview:

PGY 1 & 2 Emergency Medicine (EM) Residents rotate in the OB/GYN Service at JDWNRH. They function as a full member of the team working under the direct supervision of

the attending OB/GYN. This rotation follows the model of graded and progressive responsibility, and expectations of the resident are commensurate with their experience and training with senior residents carrying a greater patient load and gaining experience in more technically advanced procedures.

Evaluation and Feedback:
Written evaluations of EM residents are completed by the supervising Anesthesia attending(s) on service for that period of time. Procedures performed on this rotation are to be documented in the residents' procedure logs.

Rotation Goals:
The major goals for the OB/GYN rotations are to gain experience with the assessment and management of the pregnancy & laboring patient and manage obstetric complications as they arise by effectively utilizing available institutional resources to deliver optimal patient care.

Rotation Objectives:
After completing the OBG/YN rotation, the EM residents will be expected to at their training level:

- Demonstrate appropriate history and physical examination skills for pregnant patients with a spectrum of medical complaints.
- Demonstrate the skills and techniques necessary to manage a normal spontaneous vaginal delivery while effectively utilizing institutional resources available.
- Demonstrate the ability to evaluate and manage post-partum complaints and complications.
- Demonstrate the ability to evaluate and manage labor in a pregnant woman.
- Demonstrate the ability to appropriately order and interpret data from laboratory, radiographic, and other diagnostic tests in the management of pregnant and post-partum patients.
- Demonstrate the ability to appropriately communicate in comprehensible language to patients and family members in a compassionate and professional manner.
- Demonstrate the ability to function as part of the integrated health care team by being open and responsive to input/feedback from other team members and peers.

Rotation: Internal Medicine: R 1
Rotation Overview:
PGY 1 Emergency Medicine (EM) Residents rotate in the Internal Medicine Department at JDWNRH and Cardiac and GI subspecialties with a focus on management of cardiac and GI conditions. They function as a full member of the team working under the direct supervision of the IM attending staff & subspecialists.

Evaluation and Feedback:
Written evaluations of EM residents are completed by the supervising Internal Medicine attending(s) on service for that period of time. Procedures performed on this rotation are to be documented in the residents' procedure logs.

Rotation Goals:
The major goals for the Internal Medicine rotation are to gain experience with the assessment and management of adult inpatients and their medical conditions effectively utilizing available institutional resources to deliver optimal patient care.

Rotation Objectives:
After completing the Internal Medicine rotation, the EM residents will be expected to at their training level:

- Demonstrate appropriate history and physical examination skills for adult patients with a spectrum of medical complaints.
- Demonstrate the skills and techniques necessary to manage a wide range of disease (including but not limited to ACS, stroke, sepsis, asthma, pneumonia, GI bleeding, complications of diabetes, renal disease and dialysis emergencies, HIV/AIDS, liver disease, and heme-onc complications) while effectively utilizing institutional resources available.
- Demonstrate the ability to evaluate and begin to manage in-patient complaints and complications as they arise in the hospitalized patient.
- Demonstrate the ability (with direct supervision) to evaluate and manage the rapidly deteriorating hospitalized patient by mobilizing resources and coordinating a higher level of care for the patient.
- Demonstrate the ability to appropriately order and interpret data from laboratory, radiographic, and other diagnostic tests in the management of medical patients.
- Demonstrate ability (under supervision) with basic procedures commonly required by hospitalized patients, including central lines, paracentesis, thoracentesis, lumbar puncture, and arterial lines.
- Demonstrate the ability to appropriately communicate in comprehensible language to patients and family members in a compassionate and professional manner.
- Demonstrate the ability to function as part of the integrated health care team by being open and responsive to input/feedback from other team members and peers
- Demonstrate sensitivity to personal, cultural, and religious preferences that may conflict with usual medical therapies.
- Further develop knowledge and confident in EKG interpretation and subsequent management pathways including but not limited to ACS, STEMI, NSTEMI, heart failure, dysrhythmias, and other cardiac complaints.
- Further development knowledge in hepatic pathology, GI bleeds, and understanding of emergent and nonemergent indications of endoscopy

- Develop knowledge of pertinent anatomy, physical exam and pathophysiology involved in GI and cardiac conditions.
- Consider an array of drug therapy for treatment of inpatient and ED cardiology & GI patients, while correctly selecting appropriate agents based on mechanism of action, intended effect, and anticipate potential adverse side effects, including potential drug-to-drug interactions.

Rotation: Intensive Care Unit (ICU): R 2-4

Rotation Overview:

PGY 1-4 Emergency Medicine (EM) Residents rotate on the ICU at JDWNRH a four-week block every year of the training program. They function as a full member of this team working to provide critical care services to ICU patients.

This rotation follows the model of graded and progressive responsibility, and expectations of the resident are commensurate with their experience and training with senior residents carrying a greater patient load and gaining experience in more technically advanced procedures.

Evaluation and Feedback:

Written evaluations of EM residents are completed by the supervising ICU attending(s) on service for that period of time. Procedures performed on this rotation are to be documented in the residents' procedure logs.

Rotation Goals:

The major goals ICU rotation are to gain an in-depth clinical experience in the assessment and management of the critically ill medical and surgical patients through providing direct patient care at a high level of responsibility and gain extensive procedural experience with all aspects of Critical Care Medicine.

Rotation Objectives:

After completing the ICU rotation, the EM residents will be expected to at their training level:

- Perform an appropriate history and physical examination for ICU patients, including gathering patient-specific information appropriate to the critically ill patient though the health record and collateral sources, such as family members and outside hospital records.
- Correctly recognize when a patient is unstable requiring immediate intervention.
- Accurately perform reassessments after implementing a stabilizing intervention.
- Demonstrate the ability to correctly interpret data from hemodynamic monitoring, pulse oximetry, arterial blood gasses, and end-tidal CO2 monitors.
- Correctly interpret chest x-rays to assess for pathology and post-procedural line & tube placements and complications.

- Develop an appropriate differential diagnosis for common critical care problems, including respiratory failure (ventilatory and hypoxic), hypoxia, shortness of breath, gastrointestinal bleeding, hypotension, fever, altered mental status, renal failure, and liver failure.
- Demonstrate appropriate working knowledge for the diagnosis and treatment of multiple ICU patients with common critical care conditions, including: sepsis, pneumonia, COPD/asthma exacerbations, delirium, upper and lower gastrointestinal bleeding, diabetic ketoacidosis/hyperosmolar nonketotic coma, and ARDS.
- Select appropriate use of common critical care medications, including: antibiotics, insulin drips, sedatives, and vasopressors.
- Use appropriate preventive measures for common ICU complications, including stress ulcer prophylaxis, VTE prophylaxis, VAP prevention, pressure sore prevention and line-infection prevention.
- Demonstrate understanding of basic ventilator management (rate, mode, pressure support, etc) and appropriate management of the ventilated patient, including understanding of ventilator readings and arterial blood gas results.
- Demonstrate the ability to perform critical care procedures i.e central lines, arterial lines, CVP monitors, & endotracheal intubation.
- Demonstrate an understanding of the appropriate consultation and communication with indicated specialists.
- Demonstrate an understanding of the ethical and legal principles associated with the care of the critically ill patient.
- Be able to effectively communicate pertinent findings, explain medical and surgical conditions, and indications for urgent/emergent therapies in comprehensible language to patients and family members in a compassionate and professional manner.
- Engage in DNR-DNI and goals-of-care discussions with patients and/or family members.

Rotation: Pediatric & Neonatal Intensive Care Units (PICU & NICU): R 2 & 3

Rotation Overview:

PGY 1 & 2 Emergency Medicine (EM) Residents rotate in the PICU & NICU at JDWNRH for 6 weeks respectively between their PGY 2 & 3 years. This rotation follows the model of graded and progressive responsibility, and expectations of the resident are commensurate with their experience and training with senior residents carrying a greater patient load and gaining experience in more technically advanced procedures.

Evaluation and Feedback:

Written evaluations of EM residents are completed by the supervising Pediatric Intensivist attending(s) on service for that period of time. Procedures performed on this rotation are to be documented in the residents' procedure logs.

Rotation Goals:
The major goals for the P/NICU rotations are to develop in-depth exposure to the management of critically ill medical and surgical pediatric & neonatal patient and gain procedural experience within Pediatric/Neonatal Critical Care Medicine

Rotation Objectives:
After completing the Pediatric/Neonatal Intensive Care Unit rotation, the EM residents will be expected to at their training level to:

- Perform an appropriate history and physical examination for Pediatric/Neonatal ICU patients, including gathering patient-specific information appropriate to the critically ill patient though the electronic health record and collateral sources, such as family members and outside hospital records.
- Correctly recognize when a pediatric/neonatal patient is unstable requiring immediate intervention.
- Accurately perform reassessments after a stabilizing intervention is implemented.
- Demonstrate knowledge and awareness of issues unique to pediatric practice, and how these may differ from adult medicine.
- Demonstrate the ability to correctly interpret data from hemodynamic monitoring, pulse oximetry, arterial blood gases, and end-tidal CO2 monitors.
- Correctly interpret chest x-rays to assess for pathology and post-procedural line & tube placements and complications.
- Develop an appropriate differential diagnosis for common pediatric/neonatal critical care problems, including respiratory failure (ventilatory and hypoxic), hypoxia, hypotension, fever, altered mental status, and metabolic abnormalities.
- Demonstrate appropriate working knowledge for the diagnosis and treatment of pediatric/neonatal ICU patients with common critical care conditions, including sepsis and diabetic ketoacidosis, with or without comorbidities, such as congenital syndromes.
- Accurately assess new pediatric patients for potential admission to the ICU though the ED, clinics, other areas of the hospital, and outside institutions.
- Select appropriate use of common pediatric/neonatal critical care medications, including: antibiotics, insulin drips, sedatives, and vasopressors.
- Use appropriate preventive measures for common ICU complications, including VAP prevention and line-infection prevention.
- Demonstrate understanding of basic ventilator management (rate, mode, pressure support, etc) and appropriate management of the ventilated pediatric patient, including understanding of ventilator readings and arterial blood gas results.

- Demonstrate the ability to perform critical care procedures i.e central lines, arterial blood draw, endotracheal intubation.
- Be able to effectively communicate pertinent findings, explain medical and surgical conditions, and indications for urgent/emergent therapies in comprehensible language to patients and family members in a compassionate and professional manner.
- Engage in goals-of-care discussions with patients and/or family members.

Rotation: General Surgery including sub-specialties: Neurosurgery, Trauma & ENT: R 2

Rotation Overview:

PGY 2 Emergency Medicine (EM) Residents rotate in the Surgical Department at JDWNRH splitting their time between the inpatient general surgical service and subspecialties with a focus on management of trauma and neurosurgical conditions. They function as a full member of this team working to provide care ot the trauma, surgical and neurosurgical patient.

Evaluation and Feedback:

Written evaluations of EM residents are completed by the supervising Surgical attending(s) on service for that period of time. Procedures performed on this rotation are to be documented in the residents' procedure logs.

Rotation Goals:

The major goals for the Surgical rotations are to develop intensive experience in the management of trauma, neurosurgical & general surgical patients as they pertain to the practice of emergency medicine. This is a opportunity for the EM residents to gain experience and confidence in procedures as related to traumatic resuscitation and in the management of neurologic emergencies.

Rotation Objectives:

After completing the Surgery rotation, the EM residents will be expected to at their training level:

- Consistently use proper nomenclature and terminology to both describe and diagnose traumatic, surgical and neurosurgical injury and disease.
- Demonstrate the ability to appropriately prioritize, order and interpret data gathered from radiographic, laboratory, and other diagnostic modalities involved in optimal care of trauma. Review risks, benefits, contraindications, and alternatives to a diagnostic study or procedure.
- Demonstrate the ability to treat the critically ill patient with pharmacologically appropriate medications such as vasopressors, antibiotics, anticoagulants, procoagulants, as well as indicated blood products.
- Perform complicated laceration repairs in a fashion that minimizes complications

and infections and maximizes optimal patient outcome.

- Be able to effectively communicate pertinent findings and need for urgent/ emergent therapy to the patient, family, and other medical professionals.
- Be able to explain trauma & surgery-related conditions and indicated interventions simply and effectively in non-medical terms to patients and family in a compassionate and professional manner.
- Recognize acute changes in clinical status of the trauma patient, and perform re-evaluation and resuscitation as indicated. Effectively communicate changes in status to other members of the healthcare team.
- Demonstrate the ability to function as part of the integrated healthcare team by being open and responsive to feedback from other team members and peers.
- Develop knowledge of pertinent anatomy and pathophysiology involved in neurosurgical and ENT disease.
- Demonstrate appropriate history and physical examination skills for patients with a spectrum of neurosurgical and ENT complaints.

List of Electives

- Advanced Ultrasound – in Emergency Department
- Quality Improvement and Patient Safety Projects – in Emergency Department
- International Conference or Training Rotations – as available
- Neurology - as available
- Nephrology
- Pharmacology
- Psychiatry
- Prehospital
- Aeromedical
- Disaster Training

Didactic Core Topics and Timetable

- **Introduction to Core Topics in Emergency Medicine** - 4 weeks
- **Pulmonary and Critical Care -** 8 weeks
- **Cardiology -** 6 weeks
- **Gastroenterology** - 4 weeks
- **Neurology and Neurosurgery** - 6 weeks
- **Infectious Disease** - 6 weeks
- **Trauma and Orthopedics** - 8 weeks
- **Pediatrics** - 4 weeks

- **OB/Gyn and Genitourinary System** - 4 weeks
- **ENT, Ophthalmology, and Dental** - 4 weeks
- **Renal, Endocrinology, Metabolic** - 4 weeks
- **Dermatology, Hematology, Rheumatology** - 4 weeks
- **Environmental, EMS and Disaster** - 4 weeks
- **Psychiatry and Toxicology** - 4 weeks

Topics to be taught in continuous cycling such that over the course of the 4-year residency training program, each resident will be exposed to the core didactic material 3 times total to allow for graduated learning with increasing comprehension at each presentation.
The order of Topic Presentation Blocks may be subject to change based on scheduling requirements and Faculty availability.

FIELD POSTING

Learning outcome

The learning outcomes elaborated here are in alignment with the learning outcomes of the programme.
At the end of the training, the resident will be able to:
Integrate clinical experiences from previous specialty rotations and be able to work competently in a district hospital.
Be familiarize with the anesthesia works and nature of surgery in district hospitals.

Content outline

The resident is able to describe and understand working system in district hospital and be able to apply the competencies acquired during earlier postings.

* Demonstrate Anesthetic clinical knowledge and skills commensurate with his level of training by managing cases presenting in district hospitals.
* Be able to describe the organization of the health care delivery system at the district level
* Be able to identify and refer those patients which require specialized hospital services.
* Participate in the formal or non-formal (i.e. in-service) training of other health care workers and staff in the hospital, BHU and the community. (basic life supports)

EXAMINATION SYSTEM AND OVERVIEW

	Examinations	Schedule	Components		Total Marks	% Weightage‡
			Written	Practical		
Term 1-2	Institute Examination I	End of term 1	Paper I – V (Each paper) MCQ: 50% SAQ = 5 marks * 10	OSPE = 20 stations * 3 mins = 100 marks	600	Exams = 10 % (CA = 5 %)*
	Continuous assessment (CA)		Mini-Cex, DOPS, CBD, 360-degree feedback, log book/portfolio		100	
Term 3-4	Continuous assessment (CA)		Mini-Cex, DOPS, CBD, OSLER, 360-degree feedback, log book		100	(CA = 5 %)*
	Institute Examination II	End of term 4	Paper I & II (Each paper) MCQs: 50 marks SAQ = 5 marks * 6 SLEQ = 10 marks *2	OSCE, 10 stations (5 mins each) 100 marks short case (2): 50 marks * 2 Long case (1): 100 marks (OSLER)	400	Exams = 20 %
Term 5-6	Continuous assessment (CA)		Mini-Cex, DOPS, CBD, OSLER, 360-degree feedback, log book/portfolio		100	(CA = 5 %)* Thesis = 20 %
	Submission of Thesis	End of term 6	Thesis content and Presentation: 25 marks each Oral /viva voce: 50 marks		100	
Term 7-8	Continuous assessment (CA)		Quality improvement project during 7th term (July-December) with report writing and submission to Dean's office through supervisor for QI project		100	(CA = 5 %)*
	Institute Examination III	End of term 8	Paper I & II (Each paper) MCQs: 50 marks SAQ = 5 marks * 6 SLEQ = 10 marks *2	OSCE, 10 stations (5 mins) 100 marks short case (2): 50 marks * 2 Long case (1): 100 marks (OSLER)	500	Exams = 30 %
	Total Cumulative percentage					**100 %**

Continues assessment (CA): Preferably by a faculty member but in special situations a senior resident can do as a part of peer assessment

CA: will be assessed 6 monthly basis (term)

*** Institute examination I, II, thesis and III are considered bar exams, a candidate must secure minimum of 50% separately in each theory paper, OSCE and Cases

Institute Examination I:
Paper I: Anatomy and Physiology
Paper II: Biochemistry, Pharmacology and General Pathology
Paper III: Emergency Medicine and Patient safety
Paper IV: Laboratory Medicine, Chemical Pathology and Radiology
Paper V: Biostatistics, Epidemiology and Research

Institute Examination II:
Paper I: Trauma and Surgical Subspecialties: Orthopedics, Ophthalmology, Dental, ENT
Paper II: OB and Pediatrics, and Pre-Hospital/Disaster/Environmental

Submission of Thesis:
Thesis Defense Examination

Institute Examination III:
Paper I: Cardiology, Pulmonary and Critical Care
Paper II: Adult Medicine and Subspecialties - Including Psychiatry

EVALUATION OF CURRICULUM

Curriculum evaluation will be approached as an ongoing process of continuous information collection and analysis to allow for a prioritization of quality improvement (QI) activities. At regular times, information will be collected from the stakeholders (residents, supervisors, course coordinator, University, Teaching Hospitals, Ministry of Health and District Health officials) with a view to detect where optimization of the quality of the programme is needed. As it will be impossible to engage in quality improvement processes over the whole range, prioritization of QI activities are needed and the curriculum evaluation will be used for this purpose. In line with the assessment strategy, we envision a curriculum evaluation programme that will use a variety of information sources to address the most pressing questions. We foresee a yearly cycle of Plan-Do-Check-Act.

The entire curriculum will be reevaluated every 5th year with the scope to incorporate and keep with the pace of recent development in the field of medical education in order to provide maximum learning opportunities to our learners.

Procedures and Log Book

The residents will keep a current up to date log of all procedures, including resuscitations, that they have observed, assisted or performed independently both in simulation and in direct patient care. To be reviewed at Semi-Annual meeting with Course Coordinators. Below is the table of core Emergency Medicine procedures and the Minimum number of each that must be performed for graduation.

Sl #	*Procedure*	*Minimum #*
1	*Adult Medical Resuscitation*	*40*
2	*Adult Trauma Resuscitation*	*40*
3	*Pediatric & Neonatal Medical Resuscitation*	*20*
4	*Pediatric Trauma Resuscitation*	*20*
5	*Endotracheal Intubation*	*30*
6	*Central Venous Access Insertion*	*30**
7	*Chest Tube Insertion*	*10*
8	*Thoracentesis*	*10*
9	*Paracentesis*	*10*
10	*Cricothyrotomy*	*3*
11	*Joint Dislocation Reduction*	*10*
12	*Fracture Reduction*	*10*
13	*Lumbar Puncture*	*15*
14	*Wound Management*	*20*
15	*ED Ultrasound & ECHO*	*50*
16	*Pericardiocentesis*	*3*
17	*Procedural Sedation*	*15*
18	*Vaginal Delivery*	*15*
19	*Vascular Access*	*20*
20	*Regional Anesthesia*	*10*

*composed of Femoral, Internal Jugular and SubClavia

Annexure: I

FoPGM/Emergency Medicine-Portfolio 2018

Name:..... Batch:

Placement: Date from: To:

Portfolio Assessment form: Global assessment of the 6 competency domains of learning

Portfolio Assessment Scale (Global ratings)				**Domains of learning in Emergency Medicine**								
Not learned = 1 Needs further training = 2 Satisfactory = 3 Competent = 4 Mastery = 5				**Patient Care**	**Medical Knowledge**	**Practice-based learning and improvement**	**Interpersonal and communication skills**	**Professionalism**	**Systems-based practice**			
Frequency Check (✓) as applicable		**Assessor** Check (✓) as applicable								Total Score	Average Score	Signature
Completion of Term/Rotation		Resident										
Completion of Term/Rotation		Specialist Supervisor										
At the end of assessment period	Term 1 Term 2-4 Term 5-6 Term 7-8	Course Coordinator										
Term Score (T)	Term 1 Term 2-4 Term 5-6 Term 7-8											

Guideline for assessors

The residents develop competency in cognitive, psychomotor and affective domains (described under five domains of Emergency Medicine) and progress towards mastery. The milestones are colour coded as red, orange, green, blue and grey, representing as not learned, needs further training, satisfactory, competent and mastery respectively. The following descriptions under each domain shall guide the assessors while coding the milestones. Log books, formative assessment tools and professional judgments based on workplace assessment are used to code the milestones

Domain 1: Patient Care and procedural skills

I. gathers and Synthesizes essential data, generates an appropriate differential diagnosis, implements an effective management and disposition plan
II. demonstrates ability to progress along a continuum of managing a single patient to multiple patients and resources
III. provides health care services aimed at preventing health problems or maintaining health
IV. Performs safe and appropriate diagnostic, therapeutic procedures and emergency stabilization in patients of all age group

Domain 2: Medical Knowledge

I. Demonstrates appropriate medical knowledge in the care of emergency department patents
II. Demonstrates knowledge of the scientific method of problem solving, evidence-based decision making, a commitment to lifelong learning, and caring attitude
III. Applies knowledge of the study design and statistical methods to critically appraise the medical literature

Domain 3: Practice-based learning and improvement

I. identifies strengths, deficiencies, and limits in one's knowledge and expertise
II. sets learning and improvement goals and performs appropriate learning activities
III. systematically analyzes practice and implements changes
IV. participates in the education of patients, families, students, residents and other health professionals
V. uses information technology to improving patient care

Domain 4: Interpersonal and communication skills

I. communicates effectively with patients, families, professional colleagues and the public
II. works effectively as a member or leader of a health care team or other professional group
III. maintains comprehensive, timely and legible medical records
IV. leads patient care teams ensuring effective communication and mutual respect among team members

Domain 5: Professionalism

I. demonstrates compassion, integrity, and respects for others
II. demonstrates respect for patients' values, preferences and expressed needs
III. accountable to patients, society and the profession
IV. adheres to ethical and professional codes and conducts

Domain 6: Systems-based practice

I. work effectively in various health care setting and systems
II. advocates for quality patient care and optimal patient care systems
III. incorporates considerations of cost awareness and risk-benefit analysis in patient and or population-based care
IV. works in inter-professional teams to enhance patient safety and improve patient care quality
V. participates in performance improvement, in identifying system error and implementing potential system solutions to optimize emergency department functions and patient safety
VI. uses technology to accomplish and document safe health care delivery

FoPGM360 degree 2018

360 degree feedback form
(Interpersonal and communication skills)

Residents must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their families, and professional associates.

1. Assessment by: Self Others

2. Name of Resident:

Competency group: **Communicates effectively to create and sustain a therapeutic relationship with patients and families**					
	Not Applicable	Rarely demonstrates (<25-50% of the time)	Sometimes demonstrates (25% of time)	Demonstrates in most cases (50-75% of the time)	Demonstrates in majority of cases (>75% of the time)
Obtains historical information from appropriate individual (patient, caregiver, etc)	NA	1	2	3	4
Makes appropriate introductions and explains personal roles	NA	1	2	3	4
Respects privacy of patient/family by using various areas in facility for conversation, exams, etc	NA	1	2	3	4
Shows evidence of being able to sustain a continuing relationship with the patient	NA	1	2	3	4
Uses appropriate language at the proper developmental/educational level for the patient and/or caregivers/family members	NA	1	2	3	4
Uses a variety of techniques to elicit information from the patient	NA	1	2	3	4
Uses effective listening skills to elicit information	NA	1	2	3	4
Makes the patient comfortable enough to extract all necessary information when engaging in probing conversation	NA	1	2	3	4
Ensures the patient understands instructions	NA	1	2	3	4
Provides instructions to patients in a variety of ways	NA	1	2	3	4

Competency: Work effectively with others as a member or leader of a health care team or other professional group					
	Not Applicable	Rarely demonstrates (<25-50% of the time)	Sometimes demonstrates (25% of time)	Demonstrates in most cases (50-75% of the time)	Demonstrates in majority of cases (>75% of the time)
Familiarizes with the health care team member	NA	1	2	3	4
Shows respect to team members and provides information when needed	NA	1	2	3	4
Facilitates team communication when in role of team leader	NA	1	2	3	4
Assumes the role of consultant where appropriate	NA	1	2	3	4
Provides constructive verbal and written feedback to other members of the health care team	NA	1	2	3	4
Medical records are thorough, readable, and done on time	NA	1	2	3	4

Date evaluated:

FoPGMCbd p1 2018

Case based discussion (CbD)

1. Department:

2. Brief case description:

3. Setting: OPD ☐ Ward ☐ Emergency ☐ ICU ☐

4. Degree of difficulty: Low ☐ Moderate ☐ High ☐

5. Basis for case discussion:
Inpatient record ☐ Discharge summary ☐ OPD prescription ☐

Please score the trainee on the scale shown. Please note that your scoring should reflect the performance of the student against that which you would **reasonably expect at their stage of training** and level of experience. Please mark 'Unable to Comment' if you feel you have not observed the behaviour.

Assessments	Well below expectation	Below expectation	Borderline	Meets expectation	Above expectation	Well above expectation	Unable to Assess
Clinical assessment	1	2	3	4	5	6	UTA
Investigations & referrals	1	2	3	4	5	6	UTA
Management plan	1	2	3	4	5	6	UTA
Follow up & future planning	1	2	3	4	5	6	UTA
Record keeping	1	2	3	4	5	6	UTA
Overall clinical judgment	1	2	3	4	5	6	UTA

FoPGMCbD p2

Feedback	
What went well?	
Any suggestion for improvement	

11. Assessor's Name and signature:

Trainee's reflection. What have I learnt? and Where I need to focus for improvement?

12. Trainee's name and signature:

Date: D/M/Y

FoPGM DOPS 2018 P1

Direct Observation of Procedural Skills (DOPS) form

1. Department:
2. Procedure:
3. Setting: OPD ☐ Ward ☐ Emergency ☐
4. Conducted: on a patient ☐ during simulation exercise ☐
5. Degree of difficulty: Low ☐ Moderate ☐ High ☐
6. Reason for added difficulty:
7. Time pressure: Elective ☐ Critical ☐
8. Number of times same procedure done before:

9. Assessment	Significant input required from assessor	Some guidance provided by assessor	Able to manage independently	Unable to assess
Clinical knowledge	*Understand indications and contraindication, understands relevant anatomy*			
	1	2	3	UTA
Consent	*Properly explain the procedure to patient and obtains informed verbal consent*			
	1	2	3	UTA
Preparation	*Properly explains the procedure and appropriately prepares for the procedure ensure assisting staff is present*			
	1	2	3	UTA
Infection control	*Demonstrates aseptic technique and follows universal precautions*			
	1	2	3	UTA
Technical ability	*Demonstrates manual dexterity and confidence; demonstrate adequate skill and practical fluency*			
	1	2	3	UTA
Patient interaction	*Communicates, reassures the patient, eye contact with patient for discomfort*			
	1	2	3	UTA
Insight	*Knows when to seek assistance, abandon procedure or arrange alternative care to prevent harm to patient*			
	1	2	3	UTA
Documentation	*Documents the episode including problems and complications; Clear post-procedure to the patients and staffs*			
	1	2	3	UTA
Team interaction	*Provides clear instructions to assisting staff and conveys relevant information concerning the patient and plans to team members*			
	1	2	3	UTA
Overall performance	1	2	3	

FoPGM DOPS p2

Feedback	
What went well?	
Areas that needed supervisory input	
Suggestions for getting greater independence	

11. Assessor's Name and signature:

Trainee's reflection on The procedure & learning

12. Trainee's name and signature:

Date: D/M/Y

FoPGM Mini-CEX p1 2018

Mini – Clinical Evaluation (Mini- CEX) Form

Department: _____ Date: _____

Resident: _____ R-1 R-2 R-3 R-4

Patient Problem/Dx: _____

Setting:	O OPD	O Ward	O Emergency	O Other _____
Patient:	Age: _____	Sex: _____	O New	O Follow-up
Complexity:	O Low	O Moderate	O High	
Focus:	O Data Gathering	O Diagnosis	O Therapy	O Counseling

Medical Interviewing skills (O Not Observed)	Facilitates patient's telling of story; effectively uses questions/directionsto obtain accurate, adequate information needed; responds appropriately to affect, non-verbal cues.								
	1	2	3	4	5	6	7	8	9
	Unsatisfactory			Satisfactory			Superior		
Physical Examination Skills (O Not Observed)	Follows efficient, logical sequence; balances screening/diagnostic stepsfor problem; informs patient; sensitive to patient's comfort, modesty.								
	1	2	3	4	5	6	7	8	9
	Unsatisfactory			Satisfactory			Superior		
Humanistic Qualities/ Professionalism	Shows respect, compassion, empathy, establishes trust;attends to patient's needs of comfort, modesty, confidentiality, information.								
	1	2	3	4	5	6	7	8	9
	Unsatisfactory			Satisfactory			Superior		
Clinical Judgement (O Not Observed)	Selectively orders/performs appropriate diagnostic studies, considers risks,benefits.								
	1	2	3	4	5	6	7	8	9
	Unsatisfactory			**Satisfactory**			Superior		
Counseling Skills (O Not Observed)	Explains rationale for test/treatment, obtains patient's consent, educates/ counselsregarding management.								
	1	2	3	4	5	6	7	8	9
	Unsatisfactory			**Satisfactory**			Superior		
Organization/Efficiency (O Not Observed)	Prioritizes; is timely; succinct.								
	1	2	3	4	5	6	7	8	9
	Unsatisfactory			**Satisfactory**			**Superior**		
Overall Clinical Competence (O Not Observed)	Demonstrates judgment, synthesis, caring, effectiveness, efficiency.								
	1	2	3	4	5	6	7	8	9
	Unsatisfactory			**Satisfactory**			**Superior**		

Mini-CEX Time: Observing _____Mins Providing Feedback: _____Mins

Evaluator Satisfaction with Mini-CEX

1 2 3 4 5 6 7 8 9 HIGH

Resident Satisfaction with Mini-CEX

1 2 3 4 5 6 7 8 9 HIGH

Feedback	
Which aspect of the encounter went well?	
Suggested areas of improvement?	

9. Assessor's name and signature:

10. Trainee's reflections on patient and areas of learning:

11. Trainee's name and signature

Date: D/M/Y

Note 1: Reprinted with permission from the American Board of Internal Medicine, www.abim.org.

Note 2: Discussed in: Norcini JJ, Blank LL, Arnold GK, Kimball HR. The mini-CEX (Clinical Evaluation Exercise): a preliminary investigation. Ann Intern Med 1995;123:795-9.

Note 3: General Practice Curriculum, KGUMSB,2016

FoPGM Logbook 2018
Page No.

Name:……Placement: ……

Date from:…… To:…… Term……

Sl. No.	Date	Learning activity	Remarks (observed, Assisted, Performed, Attended, Presented, Participated etc)	Sig. of supervisor

ANNEXURE II

GENERIC CURRICULUM

Content outline

The resident doctor, irrespective of discipline enrolled, must be able to describe and apply the values during training and throughout the professional life (KGUMSB, 2016)

MEDICAL EDUCATION: (30 Hours)

FUNDAMENTALS OF BASIC SCIENCE

I. Fundamental principles and applications of anatomy
II. Fundamental principles and applications of physiology
III. Fundamental principles and applications of biochemistry
IV. Fundamental principles and applications of pharmacology
V. Fundamental principles and applications of pathology

BASIC LIFE SUPPORT AND ADVANCE CARDIAC LIFE SUPPORT SKILLS

BLS

I. Key changes in basic life support, reflecting the new science from the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
II. Critical concepts of high-quality CPR
III. The American Heart Association Chain of Survival
IV. 1-Rescuer CPR and AED for adult, child and infant
V. 2-Rescuer CPR and AED for adult, child and infant
VI. Differences between adult, child and infant rescue techniques
VII. Bag-mask techniques for adult, child and infant
VIII. Rescue breathing for adult, child and infant
IX. Relief of choking for adult, child and infant
X. CPR with an advanced airway

ACLS

I. Key changes in advanced cardiovascular life support, reflecting the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care
II. Basic life support skills, including effective chest compressions, use of a bag-mask device and use of an AED
III. Recognition and early management of respiratory and cardiac arrest
IV. Recognition and early management of peri-arrest conditions such as symptomatic bradycardia
V. Airway management
VI. Related pharmacology
VII. Management of acute coronary syndromes (ACS) and stroke

VIII. Effective communication as a member and leader of a resuscitation team
IX. Effective Resuscitation Team Dynamics

RADIO-DIAGNOSIS AND IMAGING

Plain Radiographs

I. Identify normal anatomy on PA, AP, and lateral chest films
II. Recognize abnormal chest films including pleural effusion, pneumothorax, pneumonia and lobe location, changes of congestive heart failure, changes of chronic obstructive pulmonary disease, atelectasis, pulmonary nodules and masses, and hyaline membrane disease of the newborn
III. Identify normal anatomy on four views of the abdomen
IV. Recognize abnormal abdominal films including ileus, small bowel obstuction, large bowel obstruction, free air, and calcifications
V. Identify normal anatomy of the spine and long bones in both adults and children
VI. Recognize abnormal bone radiographs including fractures, degenerative joint disease, osteoporosis (including vertebral collapse), and primary versus metastatic bone malignancy
VII. Identify normal anatomy on barium enema, and upper gastrointestinal series

Computed Tomography

I. Recognize and treat contrast allergy, it's signs and symptoms, and implications to the patient
II. Discuss principles of CT function and applications
III. Discuss differences between CT, MRI, plain film, and US, including the comparative benefits/drawbacks, strengths/weaknesses of each modality
IV. Discuss general indications of when to use CT as the imaging of choice
V. Identify normal anatomy found on CT of the head, spine, chest, abdomen, and pelvis
VI. Recognize abnormal head CTs including acute hemorrhage infarcts, edema, mass effect, and hydrocephalus in an infant and adult
VII. Recognize abnormal chest CTs including pulmonary nodules and masses
VIII. Recognize abnormal abdominal/pelvis CTs including diverticular disease, appendicitis, bowel obstruction, abdominal aortic aneurysms, pancreatitis, abdominal abscesses, ascites, and hepatic, pancreatic and renal masses
IX. Recognize abnormal CTs of the spine, including metastatic disease, degenerative joint disease, and disc disease.

Magnetic Resonance Imaging

I. Discuss principles of magnetic resonance imaging, including differences in abilities and applications of MRI versus CT
II. Identify normal anatomy on MRI of the head and spine
III. Recognize abnormal head and spine MRIs including central nervous system infection, masses, stroke syndromes, multiple sclerosis, disc disease, metastatic vertebral column disease, and cord compression

Ultrasound

I. Discuss general principles of ultrasound including the differences between 2D, Doppler, and M mode
II. Discuss indications and limitations of
    a. ultrasound for specific OB/Gyn situations (molar pregnancy, anencephalic pregnancy, placenta previa, fetal age using biparietal diameter and femur length, and ectopic pregnancy)
    b. vascular Doppler ultrasound (aneurysm, deep vein thrombosis, and carotid artery and peripheral vascular disease)
    c. ultrasound for gallbladder, bile ducts and liver
    d. echocardiogram (transthoracic versus transesophageal echocardiography, chamber size, valvular disease, and pericardial effusions)
    e. renal ultrasound for cysts and tumors
    f. prostate ultrasound (for evaluation of nodules and biopsy)
    g. FAST ultrasound for trauma.

Mammography

I. Discuss basics of normal and abnormal mammograms
II. Discuss indications and utility of mammography, including usefulness as a screening method and as a surgical tool for resection and biopsy.

Nuclear Medicine

I. Discuss general principles and therapeutic uses of nuclear medicine
II. Discuss mechanisms, indications, and limitations of HIDA scans, bone scans, tagged RBC scans, myocardial perfusion and function scans, bone densitometry scans, and ventilation/perfusion scans.

Angiography

I. Discuss diagnostic and therapeutic principles of angiography
II. Discuss indications for obtaining angiograms
III. Discuss applications and utility of MRA angiograms
IV. Recognize normal anatomy of the great vessels and other vasculature on angiograms
V. Discuss indications for angiograms for abnormal processes including subarachnoid hemorrhage and berry aneurysms, vascular stenotic lesions, pulmonary

angiogram for PE, aortic dissection, aortic trauma, and gastrointestinal bleeding

Become familiar with the various treatment modalities provided by interventional radiologists

I. Ultrasound-guided vascular access
II. Paracentesis
III. Thoracocentesis, chest tube insertion and management
IV. Ultrasound-guided cyst aspirations and soft tissue biopsy
V. Embolization procedures
VI. Vertebroplasty
VII. Vascular stenting
VIII. Thyroid ablation therapy
IX. Thrombolytic therapy for PE/DVT

LABORATORY MEDICINE

Foundations of Laboratory Medicine

I. Concepts of diagnostic sensitivity and specificity of a laboratory test to a specific clinical situation; negative and positive predictive values, situations in which predictive values provide critical information for developing patient care screening, diagnostic, prognostic, and therapeutic pathways/algorithms;
II. How reference intervals are derived and used and the different types of reference intervals, including those derived from population distributions, from expert consensus recommendation, or from evidence-based determination of "threshold" values based on a test's predictive value in a clinical algorithm; how reference intervals may be compartmentalized by age, sex, race, clinical state (eg, pregnancy);
III. Concept of variability in repeated measurements, as well as variability within and between individuals; describe the contributors to analytical uncertainty (precision, accuracy, bias, coefficient of variation);
IV. Discuss the long-reaching consequences of ordering unnecessary testing; consider whether routine daily monitoring tests constitute unnecessary testing; based on an understanding of reference intervals, explain why unnecessary testing may lead to higher health care costs and increased risk for the patient; similarly, discuss the consequences of failing to utilize noninvasive or minimally invasive diagnostic procedures before proceeding to invasive approaches (tier 1).
V. Distinction between testing appropriate to the clinical laboratory and those relating to research environment;
VI. External and internal validation of clinical laboratory tests;

Chemical Pathology and Immunology

I. Basic principles of toxicology - the diagnosis and management of common

clinical toxicology scenarios (eg, overdoses of acetaminophen, antidepressants, salicylates, ethylene glycol, ethanol, opiates, methanol);

II. Interpretation of the results of "drugs of abuse" panels, including causes for false positive and false negative tests, the role of confirmatory testing, and the impact of specimen adulteration;

III. Principles of therapeutic drug monitoring, including the determination of peak and trough levels vs random drug levels;

IV. Uses of metabolic testing, including electrolytes, acid-base balance, osmolality, and blood gases; interpret results for the above tests;

V. Tests relevant to diagnosis of myocardial infarction and acute coronary syndrome, cardiovascular and stroke risk, and congestive heart failure;

VI. Criteria for the laboratory diagnosis of diabetes mellitus and biochemical changes that are seen in diabetic ketoacidosis and nonketotic hyperosmolar coma;

VII. Evaluation of renal function, and criteria for chronic kidney disease; review basic microscopic urinalysis, and describe key abnormal findings;

VIII. Laboratory evaluation of hepatic, pancreatic, and gastrointestinal tract pathology;

IX. Common tests used for plasma protein analysis, including total protein, albumin, serum protein electrophoresis, and immuno-fixation electrophoresis and their disease-specific relevance;

X. Laboratory tests available for the evaluation of organ-specific and systemic autoimmune diseases, vasculitides, and immuno-deficiencies, including autoantibody testing, serum complement levels, and basic immuno-phenotyping of lymphocyte subpopulations;

XI. Role of testing for tumor markers, including the differences in their uses for screening, diagnosis, prognosis, and therapeutic monitoring;

XII. Tests available for use in reproductive biology, both prenatal and postnatal

XIII. Common approaches used in endocrinology testing, including pituitary-adrenal, parathyroid, and thyroid testing; stimulation and suppression test physiology and interpretation.

Molecular Diagnostics

I. General principles of molecular diagnostics testing in the screening, diagnosis, and/or monitoring of infectious, genetic, and oncologic diseases; describe the place of pharmacogenetic testing in clinical care;

II. Legal, ethical, and social implications of genetic testing (see law and ethics module);

Hematology

I. Methods for determination of the complete blood count, including measured vs calculated values, indications for manual vs automated leukocyte differential, and important interferences;

II. Physiology of normal hematopoiesis and the erythrocyte, leukocyte, and platelet response to pathologic stimuli;

III. Significance of erythrocyte, leukocyte, and platelet morphologic variations on the peripheral smear; know the types of leukocytes defined in the differential and their significance;
IV. Laboratory evaluation and differential diagnosis of anemia, erythrocytosis, leukopenia, leukocytosis, thrombocytopenia, and thrombocytosis;
V. Laboratory evaluation, both cellular and chemical, of body fluids, including urine and cerebrospinal, pleural, peritoneal, pericardial, and joint fluid;
VI. Physiology of coagulation, including the mechanisms of action of naturally occurring and therapeutic anticoagulants;
VII. Laboratory tests used to diagnose common bleeding and thrombotic disorders, including the hemophilias, platelet disorders, von Willebrand disease, and acquired bleeding diatheses; describe appropriate testing strategies for monitoring hemostatic and anticoagulant therapies;
VIII. Evaluation of hemoglobinopathies, and be able to diagnose common hemoglobinopathies such as sickle cell disease when presented with patient data;
IX. General principles of flow cytometric, molecular, and cytogenetic approaches used in the evaluation of leukemias, lymphomas, and related neoplastic disorders;

Microbiology

I. Describe the pre-analytic variables that determine the quality and yield of microbiologic testing:
   a. presence of normal microflora on skin and mucous surfaces;
   b. presence of contaminants in samples and the effect on culture results;
   c. effects of sample collectiontechniques, specimen transport media, timing, and storage conditions;
   d. importance of sample volume in identifying pathologic organisms in normally sterile sites that may be present in very low concentrations;
   e. effects of timing of samples to increase the recovery of various pathogens; and describe how the microbiologic workup depends on the site/samples submitted to the laboratory, and describe the basics of optimizing this workup;
II. Most frequent agents (bacterial, viral, fungal, parasitic) causing infections in different body sites or systems; and how an understanding of bacterial, parasitic, and viral pathogenesis impacts sample choice and test interpretations;
III. Factors affecting turnaround time in microbiologic workups, eg, fastidious organisms requiring special media and longer incubation times, as well as unusual tests performed infrequently;
IV. Explain the use and limitations of stains as rapid diagnostic tools; understand the use of Gram stain on sites/samples that may contain normal flora, as well as those from normally sterile body sites;
V. Use and limitations of serology in infectious diseases, to establish immune status,

to diagnose acute infection, and as a retrospective means to support diagnosis; recognize the need for the use of paired serology (acute and convalescent phase samples) and for screening and confirmatory methods (such as those used in syphilis); explain why the time course and nature of serologic response is critical in the diagnosis of common disorders, eg, viral hepatitis and HIV;

VI. Mechanisms of action of antimicrobial drugs of different classes; interpret the antimicrobial susceptibility report ;

VII. Mechanisms of bacterial resistance to antimicrobials and the spread of resistant organisms in institutions; describe the role of health care providers and of hospital epidemiology and other monitors of infection control in the hospital and the community;

Transfusion Medicine

I. Explain the following:
   a. the blood components available for clinical use;
   b. the recommended and evidence-based thresholds and indications for transfusion of the various blood components;
   c. the appropriate evidence-based dosing of blood components;
   d. the types of recombinant and other "blood component substitutes" available; and
   e. the alternatives to allogeneic blood product infusion (eg, hematopoietic cytokines, autologous donations, and intraoperative blood salvage);

II. Lifespan of transfused platelets, red blood cells, and the clotting factors present in plasma and how the efficacy of transfusion is monitored by laboratory testing (eg, expected hemoglobin and platelet count increments);

III. Pathophysiology, presentations, and acute management (and prophylaxis) of the different types of transfusion reactions;

IV. Common infectious disease risks of blood products that remain despite donor screening and blood product testing, including current data on transfusion-transmitted disease incidence and prevalence;

V. Importance of blood specimen labeling, with an emphasis on the impact transfusion errors have on patient morbidity and mortality; and the process of issuing and administering blood products, including required patient safety checks, required infusion times, and appropriate blood product storage limitations once products are issued from the blood bank (tier 1).

VI. Meaning of and rationale for type and screen (type and cross-match) for blood products and the time limits of such testing; explain the appropriate settings and processes for emergency release of blood and the use of "universal donor" blood;

VII. Define "massive transfusion," and describe the special needs of the patients in terms of metabolic derangements and the administration of blood products;

VIII. Various kinds of blood donors (eg, autologous, directed, altruistic) and the

important elements of screening pre-donation;

IX. Clinical use of therapeutic phlebotomy; various types of apheresis procedures, and examples of how each is used;

X. The HLA system and its role in transfusion and transplantation;

INFECTION CONTROL

I. Concept of infection prevention and control

II. Common misconceptions of infection prevention and control
   a. Incidence of infections at the health care facility
   b. Prevalence of infections in the community
   c. How infections are transmitted
   d. HIV and HBV
   e. Use of screening
   f. Feasibility of adhering to appropriate infection prevention and control practices

III. Need for infection prevention and control in the
   a. Health care facility
   b. Home
   c. Community
   d. Individual
   e. Institution
   f. Home
   g. Community
   h. Consequences of non-compliance

IV. Levels of responsibility.

V. Definitions:
   a. Acute care settings
   b. Ambulatory care settings
   c. Long-term care settings
   d. Home-based care
   e. Community-based care
   f. Standard Precautions
   g. Transmission-Based Precautions
   h. Isolation

VI. Common infections in each care setting and methods of prevention

VII. Factors predisposing staff, patients, families, and visitors to infection

VIII. Description and methods of
   a. Standard Precautions
   b. Transmission-Based Precautions
   c. Isolation

IX. Antisepsis
   a. Definition

X. Antiseptics
   a. Types and their uses
XI. Principles of
   a. Decontamination
   b. Cleaning
   c. Disinfection
   d. Sterilization
XII. Categories of disinfectant, their uses and limitations
XIII. Calculation of strengths of disinfectants
XIV. National standards and regulations governing infection prevention and control in health care facilities, homes and communities
XV. Barriers to implementation
   a. Lack of knowledge
   b. Misunderstanding of associated risks
   c. Inadequate equipment and supplies
   d. Poor supervision
   e. Other
XVI. Quality assurance process
   a. Definition
   b. Standards
   c. Indicators
   d. Audit

PATIENT SAFETY

I. Definition of terms
II. What is patient safety
III. What are human factors and why is it important to patient safety?
IV. Understanding systems and the impact of complexity on patient care
V. Being an effective team player
VI. Understanding and learning from errors
VII. Understanding and managing clinical risk
VIII. Introduction to quality improvement methods
IX. Engaging with patients and carers
X. Minimizing infection through improved infection control
XI. Patient safety and invasive procedures
XII. Improving medication safety

MEDICAL LAWS AND ETHICS

I. Medical Law and Ethics
   a. Importance in the ambulatory healthcare settings
   b. Codes of Ethics
   c. Confidentiality

II. Medical Practice Management
   a. Group practices
   b. Managed Care
   c. Liabilities
   d. Licensures, certifications, and registrations.
III. Liability and Duties
   a. Types of law- national and international
   b. Controlled substances
   c. Contracts
   d. Statute of Limitations
   e. Consent
IV. Workplace Issues
   a. Medical records
   b. Employment practices
   c. Legal implications
V. Bioethical Issues
   a. Ethical Issues in Biomedical research
   b. Life, Death, and Dying and legal documents

BASIC EPIDEMIOLOGY

Principles of epidemiology

I. Definition
   a. Epidemiology
   b. Epidemiology approach
II. Uses of epidemiology
III. Phases of epidemiology approach
   a. Descriptive epidemiology
      ✧ What is the problem
      ✧ Frequency of the problem
      ✧ Who is involved
      ✧ Where is the problem
      ✧ When did it occur
   b. Analytic epidemiology
      ✧ Analysis of causes of disease
   c. Experimental epidemiology
      ✧ Clinical or community trials
   d. Evaluation epidemiology
      ✧ Measuring the effectiveness of different health services
IV. Key components of epidemiology data
   a. What
   b. Who
   c. Where

d. When
e. How
f. Why

V. Sources of epidemiology data
   a. Census
   b. Vital statistics
   c. Morbidity data
   d. Mortality data
   e. Reports of notifiable diseases
   f. Hospital records
   g. Private physicians' offices
   h. Disease registers
   i. Community
   j. Other

VI. Measurements and their calculations
   a. Ratios
   b. Proportions
   c. Incidence rates
   d. Prevalence rates
   e. Demographic rates

VII. Relationship between predictive value and disease prevalence

VIII. Screening
   a. Definition
   b. Screening tests
   c. Validity and reliability of screening tests
   d. Screening programmes

IX. Surveillance
   a. Definition
   b. Methods
   c. Approaches

X. Preparation of tables and graphs
   a. Graphs
   b. Histograms
   c. Population pyramids
   d. Bar charts
   e. Pie charts
   f. Scatter diagrams
   g. Maps.

Infectious disease process

I. Definition
   a. Carrier

b. Endemic
c. Epidemic
d. Pandemic
e. Immunity
f. Immune response
g. Herd immunity
h. Immunoglobulins
i. Host response
j. Hypersensitivity
k. Infection
l. Infectivity
m. Pathogenicity
n. Virulence
o. Immunogenicity
p. Sporadic

II. Dynamics of disease transmission
   a. Chain of infection

III. Classification of the mechanisms of disease transmission
   a. Contact transmission
   b. Direct transmission
   c. Indirect transmission
   d. Droplet transmission
   e. Airborne transmission
   f. Common vehicle transmission
   g. Vectorborne transmission

IV. Description
   a. Immunity
   b. Host response
   c. Herd immunity
   d. Carrier
   e. Nosocomial infection
   a. Definition
   b. Modes of transmission
   c. Preventive measures

V. Risk factors for the occurrence of communicable diseases among population groups
   a. Extremes of age
   b. Presence of underlying disease/infection
   c. Natural/Passive immunity
   d. Trauma/Invasive procedures
   e. Medications
   f. Lifestyle
   g. Cultural

h. Socio-economic
i. Environmental
j. Organization of health services

RESEARCH AND BIOSTATISTICS

Research methods

I. Definition of common terms and concepts used in research
   a. Quantitative research
   b. Qualitative research
   c. Variable
   d. Subject
   e. Sampling
   f. Population
   g. Pilot study
   h. Validity
   i. Reliability
   j. Bias
II. Types of research
   a. Historical
   b. Descriptive
   c. Experimental
III. Basic research process
   a. Identification of problem
   b. Statement of problem
   c. Definition of terms
   d. Statement of hypothesis
   e. Identification of assumptions
   f. Literature search
   g. Definition of setting: geographical, population, etc.
   h. Definition of population to be studied
IV. Problem statement
   a. Characteristics of a problem statement
V. Methods of sampling and collection
   a. Sampling methods
   b. Probability methods
   c. Non-probability methods
   d. Data collecting methods
      ✧ Questionnaire
      ✧ Interview
      ✧ Observation
      ✧ Focus group discussion
      ✧ Document search

VI. Principles of data collection, analysis, and interpretation
   a. Pre-testing of instrument
   b. Validity
   c. Reliability
   d. Control for bias
   e. Statistical analysis
   f. Interpretation
      ✧ Meaning
      ✧ Limitation
      ✧ Usefulness

VII. Strengths and limitations of sources of health data
   a. Organizing data
   b. Analyzing data
   c. Interpreting data
   d. Implications of findings
   e. Limitations
   f. Summarizing
   g. Conclusion
   h. Recommendations

VIII. Ethical and legal issues relevant to research
   a. Consent
   b. Benefits
   c. Confidentiality
   d. Acknowledgement
   e. Other

IX. Research methods relevant to clinical practice
   a. Surveys
   b. Case studies
   c. Experiments
   d. Case-control studies
   e. Cohort studies

X. Design a research proposal in one's area of practice or related fields

XI. Writing the research report

XII. Presentation of study.

Biostatistics

I. Definition of terms
   a. Statistics
   b. Biostatistics
   c. Vital statistics
   d. Descriptive statistics
   e. Inferential statistics

II. Purposes of statistics
    a. Summarization of data
    b. Comparison of data sets
    c. Research methodologies
III. Types of statistics
    a. Descriptive
    b. Inferential
IV. Uses of statistics in clinical practice /public health
    a. Surveillance
    b. Presentation of data
    c. Epidemiology
    d. Identification of public health problems
    e. Policy analysis and formulation
    f. Planning
V. Calculation of the following measures of central tendency
    a. Mean
    b. Median
    c. Mode
VI. Measures of variation and their calculation
    a. Range
    b. Variance
    c. Standard deviation
VII. Theoretical distribution of variables
    a. Normal distribution
    b. Binomial distribution
VIII. Relationship between sample statistics and population parameters
    a. Sample mean and population
    b. Sample proportion and population proportion
    c. Sample variance and population variation