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Saudi Commission for Health Specialties

Pediatric Emergency Medicine

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بسم الله الرحمن الرحيم

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FOREWORD

A post-graduate medical education program intends to train high-quality physicians to ensure that all the healthcare needs of the society are adequately met. For a medical practitioner to be effective, he/she should not only be well trained in the scientific aspects of medicine, but also needs to draw from a wealth of knowledge and skills that are applicable to specific situations. In many countries, the model of physician competence is drawn from the Canadian Medical Education Directives for Specialist (CanMEDS) framework. This model is distinct in the sense that it not only emphasizes biomedical expertise, but also relies on various non-medical expert roles to meet the needs of the patients and society as a whole. The Saudi Commission for Health Specialties (SCFHS) has adopted the CanMEDS framework and has applied the framework to post-graduate training programs for framing the base curriculum of all training programs, including the Saudi Pediatric Emergency Fellowship Program. The CanMEDS framework specifies seven roles, including medical expert, communicator, collaborator, manager, health advocate, scholar, and professional. Therefore, trainees will be required to function considering these roles.

A systematic process was adopted to develop the core curriculum. First, the curriculum development committee members were selected, after which a number of meetings were held with the curriculum advisory members; the curriculum template was then recommended by the SCFHS regarding integration of the CanMEDS framework; the content was subsequently refined, and a short version of the curriculum was developed. Thereafter, the curriculum was submitted for approval of the scientific committee.

The goal of the curriculum was to ensure that it serves as a complete reference for the Saudi Pediatric Emergency Fellowship Program, which takes in to account the learning process, training, assessment, and certification requirements. From the beginning, collaborative support from the SCFHS, training centers, program supervisors, and clinical tutors was stressed to realize effective implementation of the curriculum. It was also made clear that the curriculum would be reviewed periodically, and the schedule of review was decided by the scientific council of the Saudi Pediatric Emergency Fellowship Program to pave the way for continuous quality enhancement and to match emerging trends. All trainees will adhere to the rules and regulations of the training program. When the trainees successfully complete the program, the "Saudi Pediatric Emergency Fellowship" certificate will be awarded.

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ABBREVIATIONS AND DEFINITIONS USED IN THIS DOCUMENT

Table 1: Abbreviations

Term	Definition
ABG	Arterial Blood Gas
ACLS	Advanced Cardiac Life Support
ADHD	Attention Deficit Hyperactivity Disorder
AHA	American Heart Association
ATLS	Advanced Trauma Life Support
AVPU	A:Alert V:Respond To Voice P:Respond To Pain U:Unresponsive
BLS	Basic Life Support
BRUE	Brief, Resolved Unexplained Events
BVM	Bag-Valve-Mask
C	Common
CBD	Case-Based Discussion
CEP	Core Education Program
CEX	Mini-Clinical Evaluation Exercise
CPAP	Continuous Positive Airway Pressure
DAMA	Discharge Against Medical Advice
DIC	Disseminated Intravascular Coagulation
DKA	Diabetic ketoacidosis
DOPS	Direct Observation of Procedural Skills
EBM	Evidence-Based Medicine
ECG	Electrocardiogram
ED	Emergency Department
EFAST	Extended Focused Assessment Sonography in Trauma
EMS	Emergency Medical Services
ENT	Ear, Nose, Throat
ERC	European Resuscitation Council
FAST	Focused Assessment with Sonography in Trauma
FBs	Foreign Bodies
FITER	Final In-Training Evaluation Report
GCC	Gulf Cooperation Council Countries
GCS	Glasgow Coma Scale
GE	Gastroenteritis
HAI	Hospital-Acquired Infection
HAZMAT	Hazardous Materials
ICP	Intracranial Pressure
IPSG	International Patient Safety Goal
ITER	In-Training Evaluation Report
IVP	Intravanous Pyelogram
KASCH	King Abdullah Specialist Children Hospital

KKUH	King Khalid University Hospital
KPIs	Key Performance Indicators
KSMC	King Saud Medical City
L	Life, Limb, or Vision Threatening
LAMA	Left Against Medical Advice
LMA	Laryngeal Mask Airway
LP	Lumbar Puncture
MCQ	Multiple-Choice Question
MOH	Ministry of Health
NAI	Non-Accidental Injury
NGT	Nasogastric Tube
NICU	Neonatal Intensive Care Unit
NIV	Non Invasive
NRP	Neonatal Resuscitation Program
OD	Over Dose
OGT	Oral Gastric Tube
OSCE	Objective Structured Clinical Examination
P	Preventable
PALS	Pediatric Advanced Life Support
PAPs	Pediatric Acute Presentations
PD	Program Director
PEM	Pediatric Emergency Medicine
PICU	Pediatric Intensive Care Unit
POCUS	Point-Of-Care Ultrasound
PSA	Procedural Sedation Analgesia
QI	Quality Intervention
RSI	Rapid Sequence Intubation
SCA	Sickle Cell Anemia
SCFHS	Saudi Commission for Health Specialists
SCIWORA	Spinal Cord Injury Without Radiographic Abnormality
SIDS	Sudden Infant Death Syndrome
SIRS	Systemic Inflammatory Response Syndrome
SOE	Structured Oral Examination
SPA	Suprapubic Aspiration
T	Treatable
TCA	Tricyclic Antidepressant
UTI	Urinary Tract Infection
VPS	Ventriculoperitoneal Shunt

Table 2: Definitions

Term	Definition
Assessment	Types of assessment, include end of shift evaluation, feedback (verbal), direct observation of procedural skills (DOPS), mini-clinical evaluation exercise (CEX), 360-degree, summative, formative, multiple-choice questions (MCQs), slides, promotion, final, objective structured clinical examination (OSCE), and written examination
Canadian Medical Education Directives for Specialist (CanMEDS) roles	The CanMEDS Framework is organized into seven thematic groups of competencies that are expressed as physician roles.
Competence	Refers to the abilities needed to practice effectively within a defined scope and context.
Core specialty topics/core subspecialty topics	Topics that pertain to that specialty and are essential to know and master.
Goal	The purpose toward which an endeavor is directed. These goals are identified as follows: not measurable, open frame, or intangible.
Mentor	An experienced and trusted adviser who supervises and advocates for the trainee.
Objective	The purpose toward which an endeavor is directed. Such objectives are specific, measurable, and tangible and adhere to a time-frame.
Procedures (clinical skills)	Any discrete and observable act within the overall process of patient care
Program director	A person who oversees the overall process of training, organizes all requirements of the trainees, acts as a liaison between the Saudi Council for Health Specialties and the training center, follows the trainees' progress during their training process, and evaluates trainees during that period.
SBAR	The SBAR (Situation-Background-Assessment-Recommendation) technique provides a framework for communication between members of the health care team about a patient's condition.
Trainee	A person who is learning and practicing the skills of a particular job.
Universal topics (modules)	Topics that apply to all trainees in all subspecialties.

1. INTRODUCTION

The Kingdom of Saudi Arabia is geographically the fourteenth largest country in the world, with a land area of approximately 22,400,000 km^2, and it has a population of more than 34 million people. A unique feature of the Saudi population is that a significant portion of the population is young, with approximately 50% aged <20 years; furthermore, the male-to-female ratio is 57.48:42.52, and more than 83.8% of the population dwells in urban areas. With a birth rate of 1.9 births per 1000, the population growth rate is pegged at 2.06%. The reported death rate is 5.3 per 1000 people aged <1 year and 6.2 per 1000 people aged <5 year.[1] The leading causes of death among children in Saudi Arabia according to the World Health Organization (WHO 2017) include congenital causes, pre-term causes, and road traffic accidents, as well as three other predominant causes. The WHO also estimates the probability of death before 15 years of age to be 5% for male children and 4% for female children.[2]

In the Middle East, pediatric emergency medicine (PEM) is an evolving specialty that has emerged as a board-certified pediatric subspecialty after similar global trends. With the objective of improving the extent of care for acutely ill and injured children, PEM has grown rapidly in Saudi Arabia in recent years, and the Saudi Commission for Health Specialties (SCFHS) officially recognized PEM in 2005.[3]

Diverse age groups and medical emergency conditions come under the purview of PEM. Patient categories include neonates, infants, children, teens, and young adults, and patients may have health difficulties such as fever, dehydration, infections, injuries, poisoning, asthma, cuts, and animal bites. Special equipment and procedures are adopted by PEM for the diagnosis of diseases and for reducing the mortality rate. It is important that pediatric emergency physicians be highly qualified experts who can treat acute medical problems that require urgent medical help or resuscitation. In addition, pediatric emergency physicians should possess the essential skills of critical thinking, decision-making, and timely referral of cases to the concerned specialty.[4]

Key requirements of the PEM specialty include the ability to perform in a variety of emergency settings, ranging from urgent care to acute care pediatric emergencies as well as critical care and resuscitation. Moreover, experience in countrywide disaster management is essential.

The PEM program aims to train fellows who will eventually provide expert pediatric emergency care for acutely ill and injured patients. Furthermore, the fellows will be equipped to become skilled teachers, meticulous investigators, and highly competent administrators. The program spans 2 years, and it is delivered as a joint program with combined rotations in SCFHS-accredited hospitals so that the fellows are trained in both theoretical and practical aspects of PEM. Analytical skills of PEM fellows are augmented to make them capable of conducting clinical or healthcare research independently and provide acute care for pediatric emergencies in primary care facilities.

1.1 History

The Saudi PEM Fellowship Program is a post-graduate training program that enjoys the distinction of being the only PEM program in the region that includes fellows from all regions of Saudi Arabia as well as other Gulf Cooperation Council (GCC) countries. It was established in 2005 as a joint program between two centers, namely, the King Fahad National Guard Hospital

and the King Faisal Specialist Hospital, under the supervision of the SCFHS. The program was founded by Dr. Arifi and his initiative group, with the objective of catering to the needs of highly specialized PEM experts countrywide.[5]

By the end of 2006, the first three fellows graduated from the program. Today, after 14 years, 100 PEM specialists have successfully graduated from this program, and they have been delivering excellent service in the kingdom as well as in other GCC countries. These specialists lead the PEM specialties in their respective hospitals and are able to significantly improve their respective emergency departments (EDs).

Fellows in this joint program enjoy the advantage of being exposed to all training centers, with each center presenting diversity in the patient population, pathologies, level of severity, and different emergency systems. As of 2019, there are 12 accredited training PEM centers, distributed into 2 regions; Central and West region . Central region includes 7 centers; all in Riyadh,namely, the King Abdullah Specialist Children Hospital (formerly King Fahad National Guard Hospital), King Faisal Specialist Hospital and Research Centre , King Fahad Medical City, King Khalid University Hospital, King Saud Medical City, Prince Sultan Military City, and Security Forced Hospitals. While West region includes 5 centers namely, Makkah Maternity and Children Hospital; Madinah Maternity and Children; Khamees Mushat Maternity and children Hospital; Prince Sultan Military City and King Abdullah Specialist Children Hospitalin Jeddah.

1.2 The Mission

The mission of the Saudi PEM Fellowship Program is to train competent and subspecialized fellows who are life-long learners and provide high-quality pediatric emergency care by using innovative and transformational tools in medical education and research, as well as make the best use of available resources.

1.3 The Vision

The Saudi PEM Fellowship Program will provide international excellence and regional leadership in preparing competitive pediatric emergency fellows.

1.4 Values

- Being professional
- Key components of all national healthcare system
- Meeting the unique medical needs of pediatric patients
- Accurately, safely, and effectively using and interpreting the results of technological tools
- Performing evidence-based practice
- Ensuring family-centered care

1.5 Strategic Plans

- Implement a continuous state of surveillance, analysis, and process improvement regarding fellowship training
- Provide training in PEM to improve the quality of care, responsibility, and decision-making abilities
- Deliver individualized, compassionate, patient-centered, high-quality healthcare to acutely ill or injured children

- Promote an environment that identifies and develops present and future healthcare leaders in all aspects of pediatric emergency subspecialties
- Improve the work culture prevalent in pediatric EDs to make them the best possible places to work, practice, and receive care through professional engagement and promoting a culture of positive relations

1.6 Ten Most Common Pediatric Emergencies

- Pediatric resuscitation
- Common respiratory emergencies such as bronchial asthma, bronchiolitis, and upper airway diseases
- Status epilepticus and pediatric disorders associated with seizures
- Traumatic injuries
- Metabolic and diabetic emergencies and electrolyte imbalance
- Fever
- Cardiac emergencies
- Neonatal emergencies
- Orthopedic emergencies
- Acute surgical emergencies
- Toxicological emergencies

1.7 Ten Most Common Pediatric Emergency Procedures

- Pediatric sedation and analgesia
- Cardiopulmonary resuscitation-related procedures
- Intravascular access and intraosseous lines
- Airway management and ventilator support
- Fracture reduction
- Suturing and adhesive procedures for wound management
- Foreign body (FB) removal
- Trauma resuscitative procedures and immobilizations
- Lumbar puncture
- Poison decontamination procedures

1.8 Common Causes of Deaths in Pediatric Populations According to the WHO 2017 Report[2]

- Congenital anomalies
- Prematurity
- Injuries
- Acute respiratory infections
- Neonatal sepsis
- Diarrheal diseases

1.9 Essential Attributes of Competent Pediatric Emergency Physicians

1.9.1 Contextual Aspects

- Display an understanding of the context and environment in which pediatric emergency physicians work, including working conditions, community, culture, and financial and regulatory frameworks
- Perceive how local community factors (including socioeconomic and workplace factors, geography, and culture) impact patient care in EDs
- Consider the impact of overall emergency workload on the care provided to the individual patient
- Be aware of the financial and legal frameworks in which healthcare is delivered at the practice level and understand the influence of this framework on pediatric EDs in hospitals
- Recognize the impact of the doctor's personal life and working environment (shift work and stressful conditions) on the care that he/she provides

1.9.2 Attitudinal Aspects

- Be aware of professional capabilities, values, feelings, and ethics
- Thoroughly understand one's own capabilities and values in dealing with all emergency cases
- Identify different ethical aspects of clinical practice (prevention, diagnostics, and therapy)
- Be aware of one's own attitudes and feelings and their impact on practice
- Appreciate personal and professional ethics and patient rights
- Understand the interaction of work and personal life and the need for a good balance between them

1.9.3 Scientific Aspects

- Establish an evidence-based approach to practice that is maintained through continuous learning and quality improvement
- Be aware of the general principles, methods, and concepts of scientific research and the fundamentals of statistics
- Acquire knowledge regarding the scientific background underlying disease pathology as well as the symptoms, diagnosis, therapy, and prognosis of common pediatric emergencies and life support measures
- Become familiar with appraisal of the literature and apply evidence wisely to patient problems
- Maintain continuous learning and quality improvement during his/her future career to keep abreast of emerging trends in evidence-based care

1.10 Features of the Revised Curriculum

1.10.1 Philosophical Orientations

- (CanMEDS)-based curriculum to cover all aspects of a competent physician's work
- Well-defined supervisory roles and regulations
- Staged (step-wise) curriculum through the 2 years of training
- Becoming adept at the newly evolving subspecialties' skills and new methods of teaching
- Simulation-based education curriculum and learning pertinent skills

1.10.2 Expanded Range of Competencies

- Integration of knowledge, skills, and attitude aspects
- Incorporation of new knowledge and skills in teaching methods

1.10.3 Evidence-Based Approach

- Demographic data (e.g., disease prevalence)
- Practice data (e.g., procedures performed)
- Patient profile (e.g., urban vs. rural)
- Ability to accommodate future needs

1.10.4 Holistic Assessment

- Strong emphasis on continuous assessment
- Balanced assessment methods
- Maintaining a logbook to support learning and individualized assessment (see appendix)
- Built-in formative assessment with constructive feedback
- Evaluation of presentation during fellow academic activities

1.11 What Is New in the Current Updated Version?

This updated version of the Pediatric Emergency Fellowship Training Program curriculum is based on the competency-based framework adopted by the SCFHS.

Moreover, other changes in this version are as follows:

- A competency-based format (based on the guidelines of CanMEDS) has been employed to list all the rotations of the training program, as well as the educational activities and the objectives.
- Some minor changes have been effected in the duration of some rotations.
- A list of the most important clinical topics and procedures in PEM as well as universal topics has been added.
- Expected level of competency for core specialty level problems has been added
- A new section on pediatric emergency medicine training program milestone have been added with their suggested methods of assessment
- A new section on learning opportunities have been incorporated
- A list of formative assessment tools for F1 and F2 have been incorporated.
- In accordance with the new Examination Rules and Regulations of the Saudi Commission, the 'Promotion', 'Part One Examination', and 'Final Examination' have been revised.

1.12 Pediatric Emergency Medicine Fellowship Program Structure

1.12.1 General Training Requirements

- Admission into the program is in accordance with the Commission Training Rules and Regulations.
- Trainees shall abide by the training regulations and obligations established by the SCFHS.
- The training is a full-time commitment. Fellows shall be enrolled in full-time, continuous education for the entire duration of the program.

- Training is to be conducted in institutions accredited for training by the SCFHS accreditation process.
- Trainees shall be actively involved in patient care with gradual progression in responsibility.
- Fellowship will accept only certified pediatric or emergency medicine physicians to be enrolled and trained in this program.

1.12.2 Duration and Rotations

All fellows will undertake core training in PEM at SCFHS-accredited training centers. This is a 2-year training program comprising specialty-based training in pediatric emergency and essential emergency medicine subspecialties that are necessary to build skills to eventually lead the clinical shift as a consultant. Other core training rotations are included to provide consistency with worldwide training in PEM and to fulfill all deficiencies in trauma, surgical, and intensive care skills.

Fellows will complete a minimum of 12 months of PEM. A minimum of 6 months per year will ensure graded exposure and responsibility. The suggested program design (below) ensures that the rotations are spread evenly throughout the year to account for seasonal variation of illness and injury. During these rotations, fellows will work approximately equivalent to full-time hours in a variety of shifts.

There are many essential emergency subspecialties, such as surgical, intensive care, research, and administrative rotations that are developed to ensure the best of training in knowledge about all pediatric emergencies and skills; these rotations are mandatory to ensure coverage of all aspects of emergency medicine in the 2-year program.

Elective rotations are at the discretion of the fellow to provide them the opportunity to track their deficiencies and obtain additional training in their future targeted niche. Throughout the 2 years, fellows will be obligated to incorporate and collaborate in research and administrative roles.

Fellows will also be expected to assume increasing responsibilities in patient management, teaching, and administration over the course of the fellowship. While on duty, fellows will be given first priority for all technical procedures (to do or teach/supervise) and the opportunity to lead all resuscitations. They will maintain a logbook of procedures and resuscitations to prospectively identify and correct any areas of limited experience.

Timetable of the Rotation:

Two-year PEM program MASTER ROTATION LIST		
First-year rotations (F1) (12 months)		
Emergency track	Pediatrics tracks	Rotation
6 months	6 months	Pediatric emergency medicine
1 month	1 month	Pediatric ICU
1 month	1 month	Pediatric anesthesia
1 month	1 month	Pediatric orthopedics
	1 month	Pediatric plastic surgery

1 month	1 month	Research
1 month		NICU
1 month	1 month	Vacation
Second-year rotations (F2) (12 months)		
Emergency track	Pediatrics tracks	Rotation
6 months	6 months	Pediatric emergency medicine
	1 month	Adult trauma and emergency
1 month	1 month	Toxicology
1 month	1 month	Emergency ultrasound
1 month (with PEM)	1 month (with EMS)	Research/EMS
2 months	1 month	Elective
1 month	1 month	Vacation
Recommended elective and longitudinal rotations		
Emergency track	Pediatrics tracks	Rotation name
*****		NICU
****		General pediatrics
***	***	Simulation
***	***	Pediatric radiology
*	*	Administration
*	*	Pediatric ophthalmology
*	*	ENT
****	****	Child protection

1.12.3 Program Supervision

Please refer to the updated executive policy of SCFHS on admission and registration.
Website: www.scfhs.org.sa

2. LEARNING AND COMPETENCIES[5]

2.1 Overall Goals of the PEM Fellowship

Clinical

- Acquire PEM subspecialty expertise in the care of an acutely ill or injured child
- Efficiently triage and prioritize care of multiple patients
- Acquire the skills of managing a busy ED and show efficiency in time management
- Develop the skills to function as a mock attending physician (under supervision), especially in the second year of training

Teaching

- Demonstrate teaching competency in various aspects of PEM
- Run mock codes for junior fellows under the supervision of the consultant
- Bedside teaching:
  - Review cases with junior fellows and house staff
  - Provide teaching to junior fellows at a level appropriate for their training
  - Balance teaching activities with managing flow in the ED

Research

- Acquire expertise to become a productive investigator
- Become familiar with various research methods and be able to apply appropriate methodological principles to address various research questions
- Correctly critique published literature
- Run his/her own research project

Administration

- Develop expertise in administrative issues in PEM, such as leadership skills, quality assurance, scheduling, periodic review of ED charts with follow-up concerning identified problems, charting, ethics, telephone advice, legal issues, public relations, and the emergency medical services (EMS) system

2.2 Specific Objectives of PEM Rotation

MEDICAL EXPERT

1) Rapidly diagnose the acutely ill or traumatized child
2) Develop triage skills and prioritize care of children in the ED
3) Appropriately and cost-effectively utilize laboratory tests and various imaging techniques and provide a correct clinical interpretation
4) Develop expertise in common ED technical procedures and gain understanding of their indications, contraindications, and potential complications
5) Develop expertise in common ED medical and surgical cases

6) Formulate and implement a short-term management plan for each child and effectively communicate this to the patient and family as well as medical and nursing staff
7) Supervise and delegate responsibilities to junior house staff and other members of the healthcare team

COMMUNICATOR

1) Establish an appropriate physician/patient relationship with pediatric patients
2) Communicate effectively with patients and families as well as other healthcare consultants
3) Demonstrate the ability to deliver bad news with compassion and sensitivity
4) Demonstrate the ability to handle upset or abusive patients and/or caretakers
5) Demonstrate sensitivity to the cultural, ethnic, and religious backgrounds of patients
6) Develop techniques to effectively teach a variety of learners at different levels
7) Be able to discuss relevant issues around interventions

COLLABORATOR

1) Communicate and coordinate with the healthcare team regarding ED patients and manage short- and long-term therapeutic decisions
2) Develop an understanding of the EMS system, effective telephone communication, and logistics of patient transfer to and from the ED
3) Demonstrate the ability to work effectively as part of the healthcare team
4) Show willingness to receive and act on feedback from colleagues, supervisors, other healthcare workers, patients and their families, or caregivers
5) Maintain a team environment that respects the skills of other healthcare professionals and informal caregivers
6) Show an understanding of team dynamics and the problems that may occur in an interdisciplinary team
7) Understand the definition of individual responsibility as well as common causes of team dysfunction, team management methods, common causes of conflict, and case management principles
8) Recognize professional limitations and accept the need to use the skills of other consultants and healthcare practitioners to provide better care
9) Identify other healthcare practitioners (including consultants) and available healthcare resources that can be used to plan the care of an ill child
10) Perform competent consultation for referred patients to inform, educate, and advise the referring physician and solve problems while respecting the skills of the referring physician
11) Determine how decisions are made, describe communication patterns, provide constructive feedback, show abilities in conflict management and negotiation, and identify and resolve barriers that prevent effective and efficient team-care

MANAGER

1) Master the appropriate use of consultations and the patients' disposition, education, and follow-up
2) Demonstrate appropriate documentation skills regarding the disposition plan and ensure that junior residents also do this
3) Demonstrate the ability to manage time efficiently
4) Demonstrate the ability to identify medico-legal risks and take steps to address them

5) Master the ability to manage a busy ED with minimal staff intervention and optimal prioritization and patient flow
6) Obtain follow-up results of positive cultures, other tests, or radiology reports and discuss them with patients and their families

HEALTH ADVOCATE

1) Demonstrate an understanding of the determinants of health that affect patients and their families
2) Demonstrate the ability to act as an advocate for the individual patient
3) Have knowledge of the principles of health policy development
4) Have knowledge of routine preventive health initiatives
5) Demonstrate an understanding of the principles of identification and reporting of child abuse
6) Demonstrate an awareness of legal, ethical, and professional obligations to protect children from suspicious circumstances

SCHOLAR

1) Demonstrate the ability to critically evaluate the literature as it pertains to pediatric emergency care
2) Demonstrate inquisitiveness around clinical cases
3) Demonstrate the ability to apply the principles of evidence-based medicine
4) Supervise and employ bedside teaching of junior physicians

PROFESSIONAL

1) Demonstrate honesty and integrity
2) Demonstrate compassion and empathy
3) Demonstrate respect for others (health professionals, patients, and families)
4) Demonstrate reliability, responsibility, and conscientiousness
5) Demonstrate an understanding of ethical practice and apply it to his/her daily work
6) Demonstrate self-awareness and knowledge
7) Demonstrate the ability and keenness for learning and professional development

2.3 Objectives of Subspecialty Rotations

1-Orthopedics Rotation

MEDICAL EXPERT

1) Develop the ability to correctly obtain patient history and perform physical examinations for patients with musculoskeletal disorders
2) Demonstrate the ability to correctly order and interpret different modalities of radiographs in patients with orthopedic injuries
3) Demonstrate an understanding of the anatomy, mechanism of injury, presentation, complications, management, and prognosis of common musculoskeletal injuries
4) Develop skills in the diagnosis and treatment of inflammatory and infectious disorders of the musculoskeletal system

5) Learn principles of acute and chronic pain management for patients with musculoskeletal disorders
6) Develop an understanding of referral and disposition practices
7) Have knowledge of standard orthopedic nomenclature
8) Have knowledge of appropriate aftercare and rehabilitation of orthopedic injuries
9) Have knowledge about the differences in pediatric and adult skeletal anatomy and indicate how those differences are manifested considering clinical and radiographic presentations
10) Demonstrate the ability to master the application of casts for different types of stable fractures and to show knowledge about when to refer patients to other physicians and when to remove the casts
11) Describe the presentations, complications, diagnosis, and management of compartment syndrome
12) Demonstrate the ability to prioritize and manage orthopedic injuries in patients with multiple trauma
13) Describe how to evaluate and preserve amputated limb parts
14) Discuss evaluation and treatment of soft tissue injuries such as strains and crush injuries
15) Demonstrate the ability to recognize and treat soft tissue infections involving the muscle, fascia, and tendons
16) Discuss the dosages, indications, contraindications, and side effects of standard analgesic and sedative agents used for acute orthopedic trauma
17) List the indications for emergency surgery in the treatment of fractures and dislocations
18) List the indications for inpatient management of musculoskeletal disorders
19) Rotation-specific skills
    - Fracture/dislocation immobilization and reduction
    - Classification and management of open fractures
    - Arthrocentesis
    - Application of orthopedic devices, including compressive dressings, splints, and brace immobilizers

COMMUNICATOR

1) Be able to converse effectively and sensitively with orthopedic patients and their families
2) Be able to discuss informed consent and other relevant issues concerning emergency room procedures
3) Demonstrate the ability to deliver bad news effectively with compassion and sensitivity

COLLABORATOR

1) Communicate and coordinate with the healthcare team regarding both short and long-term therapeutic decisions for orthopedic patients
2) Detail the appropriate transfer of patients from one healthcare setting to another, including composing a list of issues regarding patient transfer, transfer of medical documents, and medico-legal concerns
3) Demonstrate the ability to coordinate appropriate aftercare and rehabilitation of the orthopedic patient
4) Demonstrate the ability to work effectively as part of the healthcare team

MANAGER

1) Coordinate care for patients, including the appropriate utilization of consultations and use of resources
2) Demonstrate proper documentation
3) Demonstrate the ability to manage time efficiently
4) Demonstrate the ability to identify medico-legal risks and take steps to address them

HEALTH ADVOCATE

1) Demonstrate an understanding of health determinants affecting patients and their families
2) Demonstrate the ability to act as an advocate for the individual patient and affected populations
3) Have knowledge of health policy development
4) Have knowledge of injury-preventive measures, including but not limited to sports-specific measures, seat belts, car seats for minors, and helmet wear during bicycling

SCHOLAR

1) Demonstrate the ability to critically evaluate the literature pertaining to orthopedics
2) Demonstrate inquisitiveness regarding clinical cases
3) Demonstrate the ability to apply the principles of evidence-based medicine to orthopedic cases

PROFESSIONAL

1) Adhere to the code of ethics in accordance to the Ministry of Health (MOH) Policy and Procedures
2) Treat patients and colleagues with respect
3) Demonstrate the ability of self-evaluation, including insight into strengths and weaknesses
4) Demonstrate commitment to lifelong learning
5) Demonstrate the willingness to accept responsibility for one's actions and patient care

2-Plastic Surgery Rotation

MEDICAL EXPERT

1) Demonstrate the ability to obtain appropriate patient history and perform physical examination for patients with traumatic wounds and proper evaluation of wounds
2) Demonstrate an understanding of wound pathophysiology, including cellular response, static and dynamic wound tensions, growth factors, and tensile strength
3) Understand the pathophysiology of wound healing
4) Demonstrate an understanding of the predictors of wound sepsis
5) Demonstrate effective wound cleaning skills
6) Describe the appropriate use, limitations, and potential complications of wound cleansing solutions
7) Describe the appropriate use, limitations, and potential complications of antimicrobials in the management of traumatic wounds
8) Demonstrate an understanding of various imaging modalities in the detection of soft tissue FBs

9) Demonstrate skills in various wound closure techniques, including intradermal suture, facial closure, interrupted skin sutures, running skin sutures, vertical and horizontal mattress sutures, half-buried horizontal mattress sutures, tape closure, staples, and glue use
10) Demonstrate the appropriate use of delayed closure techniques
11) Demonstrate appropriate management of special wound types, including skin ulcers, human bites, animal bites, snake bites, plantar puncture wounds, dermal abrasions, and tar burns
12) Demonstrate skills in the management of complex lacerations and list potential complications of complex lacerations
13) Demonstrate skills in the provision of analgesia and anesthesia to patients with traumatic wounds, including the use of local infiltration, topical administration, and procedural sedation
14) Demonstrate the ability to apply wound dressings
15) Describe the indications for specialty referral and follow-up of traumatic wounds
16) Demonstrate the ability to evaluate and manage disorders of the mandible, including fractures, dislocations, and infections
17) Demonstrate the ability to evaluate and manage trauma to the head, neck, face, and teeth
18) Describe the following facial fractures and discuss their diagnosis and treatment: LeFort I, II, and III, as well as zygomatic, mandibular, nose, orbital, and tripod fractures
19) Identify the sensory distribution of the ulnar, median, and radial nerves and demonstrate the technique of two-point discrimination
20) Describe the testing of muscles and tendons of the wrist and hand as well as how to diagnose injury or fractures
21) Describe boutonniere and Swan neck deformities
22) Identify the signs, complications, and treatment of the following: paronychia, felon, herpetic whitlow, septic arthritis, and deep palmar space abscess
23) Discuss evaluation and treatment of soft tissue injuries such as strains, penetrating soft tissue injuries, crush injuries, and high-pressure injection injuries
24) Demonstrate the ability to perform a digital nerve block
25) Demonstrate the correct care for burn patients, including the ability to calculate the surface area burned considering various age groups
26) Demonstrate the method for determining the correct maintenance fluid regimen for burn patients
27) State the admission criteria for burn patients, including the criteria for admission to the burn unit
28) Outline the components of evaluation and treatment of patients with cold injuries
29) State the chemical mechanism of injury and the treatment for burns due to hydrochloric and sulfuric acids, hydrofluoric acid, alkali and acid, and white phosphorus
30) List the differences between alkali and acid burns
31) State the common injuries/conditions associated with electrical injuries and list the potential complications
32) Rotation-specific skills:
    - various wound closure techniques
    - provision of analgesia and anesthesia to patients with traumatic wounds, including the use of local infiltration, topical administration, and procedural sedation
    - digital nerve block

COMMUNICATOR

1) Be able to converse effectively and sensitively with plastic surgery patients and their families
2) Be able to discuss relevant issues regarding procedures

COLLABORATOR

1) Communicate and coordinate with the healthcare team effectively
2) Detail the proper and appropriate transfer of patients between healthcare settings
3) Demonstrate the ability to coordinate appropriate aftercare and rehabilitation of the plastic surgery patient
4) Demonstrate an understanding of the roles of various participants in inpatient care

MANAGER

1) Coordinate care for patients, including the appropriate utilization of consultant specialists and community resources

HEALTH ADVOCATE

1) Demonstrate the ability to act as an advocate for the individual patient

SCHOLAR

1) Demonstrate the ability to critically evaluate the literature pertaining to plastic surgery

PROFESSIONAL

1) Treat patients and colleagues with respect
2) Demonstrate the ability of self-evaluation, including insight into strengths and weaknesses

3-Pediatric Intensive Care Rotation

MEDICAL EXPERT

1) Demonstrate the ability to rapidly obtain patient history and perform physical examination in critically ill children
2) Demonstrate the ability to provide information in a concise and coherent format
3) Demonstrate the ability to assess children for the presence of severe illness and the appropriateness of ICU admission and pre-operative screening
4) Demonstrate the ability to lead the pediatric resuscitation and critical care team
5) Demonstrate the ability to perform the following procedures: tube thoracostomy, central line placement, transvenous cardiac pacing, and arterial line placement
6) Describe the techniques of needle pericardiocentesis and surgical/needle cricothyroidotomy
7) Demonstrate the ability to use and interpret data from ECG monitors, 12-lead ECG monitors, cardiac and hemodynamic monitors, arterial blood gases, pulse oximetry, end tidal CO_2 monitors, ventilators, and intracranial pressure monitors in children

8) Demonstrate the ability to diagnose and treat shock, sepsis, fluid and electrolyte abnormalities, cardiac failure, cardiac dysrhythmias, renal failure, hepatic failure, and toxicological emergencies
9) Demonstrate an understanding of the etiologies, diagnosis, and treatment of respiratory distress syndrome and multisystem organ failure
10) Demonstrate the appropriate prioritization of diagnostic and therapeutic interventions in ill children
11) Demonstrate an understanding of appropriate resource utilization
12) Demonstrate an understanding of the appropriate role of consultants in managing ill children
13) Demonstrate an understanding of the order of appropriate fluids, blood, blood products, and blood substitutes necessary for the resuscitation of children
14) Describe the dosages, indications, and contraindications of pharmacologic interventions for shock, cardiac failure, dysrhythmias, sepsis, trauma, toxins, respiratory failure, hepatic failure, renal failure, and neurologic illnesses
15) Demonstrate the ability to deal with complications of volume resuscitation and pharmacologic interventions
16) Select appropriate antibiotics for pediatric patients with severe infection
17) Manage a patient on a ventilator, including knowing information about the ventilator types, appropriate use of ventilation techniques, indications for extubation, and weaning and extubation techniques
18) Demonstrate an understanding of continuous positive airway pressure (CPAP) and bi-level positive airway pressure modes of positive airway pressure
19) Demonstrate the ability to rapidly assess and treat emergencies including but not limited to dysrhythmias, cardiac arrest, pneumothorax, tension pneumothorax, dislodged endotracheal tubes, occluded endotracheal tubes, anaphylaxis, pulmonary embolism, hemorrhage, and increased intracranial pressure
20) Demonstrate the ability to deliver safe procedural sedation and deep sedation to children
21) Demonstrate an understanding of the ethical and legal principles applicable to the care of critically ill children
22) Rotation-specific skills:
    - Endotracheal intubation with different modalities
    - Cricothyroidotomy
    - Adjunct airway management using a laryngeal mask airway (LMA) and bag-valve-mask (BVM)
    - Ventilator management: invasive and noninvasive
    - Thoracentesis
    - Tube thoracostomy
    - Peripheral and central intravenous insertion
    - Arterial line insertion
    - Intraosseous infusions
    - Sedation/analgesic management

COMMUNICATOR

1) Be able to converse effectively and sensitively with critically ill patients and their families
2) Be able to discuss relevant issues regarding critical care producers
3) Demonstrate the ability to deliver bad news effectively with compassion and sensitivity

COLLABORATOR

1) Demonstrate the ability to appropriately advise physicians consulting the pediatric ICU
2) Aid in arranging safe, appropriate, and timely transportation of critically ill patients, including determining the need for land or air transport as well as the need for invasive procedures prior to transfer
3) Demonstrate an understanding of the appropriate use of consultants for critically ill patients
4) Develop an understanding of the multidisciplinary team for the management of the ICU patient, including the roles of nursing staff, respiratory therapists, dietitians, occupational therapists, physiotherapists, and consulting staff

MANAGER

1) Demonstrate an appreciation for the administrative priorities of a critical care unit (e.g., closed vs. open)
2) Demonstrate an understanding of appropriate resource utilization
3) Demonstrate an understanding of the ethical and legal principles applicable to the care of critically ill patients
4) Demonstrate the ability to identify medico-legal risks and take steps to address them

HEALTH ADVOCATE

1) Demonstrate the ability to act as an advocate for the individual patient
2) Demonstrate an understanding of "do-not-resuscitate" orders, advance directives, living wills, competency, power of attorney, and brain death criteria

SCHOLAR

1) Demonstrate the ability to critically evaluate the literature pertaining to critical care

PROFESSIONAL

1) Demonstrate the ability to self-evaluate, including insight into strengths and weaknesses

4-Anesthesia Rotation

MEDICAL EXPERT

1-know the anatomy of the upper airway

1) Know the characteristics of a pediatric airway
2) List the indications for invasive airway management
3) Demonstrate appropriate judgment regarding the need for airway intervention
4) Recognize and manage an obstructed airway
5) Demonstrate the correct use of the BVM device with understanding of the nasal and oral airways
6) List the contraindications and complications of various airway management techniques, including oral and nasal airway insertion, BVM ventilation, nasal intubation, oral intubation, cricothyrotomy, and tracheostomy
7) Demonstrate the skills for endotracheal intubation with different modalities as well as the management of complications

8) Demonstrate the skill for the use of anesthetics and neuromuscular blocking agents, including procedural sedation and rapid sequence intubation
9) Demonstrate the ability to insert a LMA
10) State the dosages, mechanism of action, indications, contraindications, and potential complications of inhalation anesthetic agents, intravenous analgesic and anesthetics, induction agents, and neuromuscular blocking agents
11) Demonstrate the ability to use standard noninvasive monitoring techniques including heart monitoring, blood pressure monitors, oxygen saturation monitor, and end tidal CO_2 monitors
12) Demonstrate the ability to manage patients on a ventilator and discuss the advantages and disadvantages of different ventilation techniques
13) Coordinate the ongoing assessment and management of intubated patients
14) Demonstrate the ability to administer local anesthetics and be familiar with agents, dosing, side effects, and techniques to monitor pain
15) Rotation-specific skills:
    - BVM ventilation
    - Oral airway insertion
    - Nasal airway insertion
    - Oral intubation (with rapid sequence induction)
    - Intravenous insertion
    - Management of monitors including:
        - Oxygen saturation monitor
        - End tidal CO_2 monitor
        - Heart monitor
        - Blood pressure monitor
        - Arterial lines
        - Ventilator utilization
        - Nerve blocks

COMMUNICATOR

1) Be able to converse effectively and sensitively with seriously ill patients and their families
2) Be able to discuss relevant issues regarding surgical procedures

COLLABORATOR

1) Demonstrate the ability to work effectively as part of a healthcare team
2) Demonstrate an understanding of the roles of various participants in the operative and critical care management of the patient

MANAGER

1) Demonstrate the ability to effectively and efficiently use anesthesia resources
2) Demonstrate proper documentation regarding management of anesthesia in patients

SCHOLAR

1) Demonstrate the ability to critically evaluate the literature pertaining to airway management and the practice of anesthesia

PROFESSIONAL

1) Treat patients and colleagues with respect
2) Demonstrate willingness to accept responsibility for one's actions and patient care

5-Toxicology Rotation

MEDICAL EXPERT

1) Recognize the probable cause of toxicity in the child, adolescent, or adult
2) Develop competence in the management of patients who ingest unknown poison, as well as those who ingest specific poisons, in addition to those who show multiple ingestions, substance abuse, and accidental versus intentional poisoning
3) Learn the need for various methods of termination of toxic exposure, hastening the elimination of poison, and protecting one's self and other team members from being intoxicated
4) Recognize the need for continued ED observation, hospitalization, or ICU care as appropriate
5) Discuss the various forms of decontamination and their indications, including activated charcoal, whole bowel irrigation, gastric emptying, and other extraordinary measures
6) Discuss the management of patients presenting with the ingestion of unknown substances
7) Discuss the management of patients presenting with the ingestion of specific substances, including acetaminophen, aspirin, tricyclic antidepressants, toxic alcohols, organophosphates, anticonvulsants, batteries, hydrocarbons, corrosives, lithium, digoxin, calcium channel blockers, antidiabetic medications, iron, and sympathomimetics
8) Describe specific toxidromes associated with various medications or toxins
9) Describe antidotes and other specific therapies available for various ingestions
10) Utilize poison information centers in an appropriate manner for consultation

COMMUNICATOR

1) Discuss relevant issues surrounding interventions with the team
2) Discuss patient care and communicate interventions with the consulting healthcare provider
3) Act as first on-call physician for toxicology referrals from the poison center, referring doctors, or EDs
4) Act as first on-call physician for on-hospital consultations to toxicology

COLLABORATOR

1) Demonstrate the ability to work effectively as part of a healthcare team both in and around the outpatient environment
2) Demonstrate an understanding of the roles of various participants in the poison information centers

MANAGER

1) Demonstrate an understanding about the proper documentation involving the management of patients
2) Demonstrate the ability to identify medico-legal risks and take steps to address them

SCHOLAR

1) Demonstrate the ability to critically evaluate the literature pertaining to toxicology
2) Actively participate in teaching seminars about common poisonings with toxicology staff
3) Demonstrate inquisitiveness around clinical cases
4) Demonstrate the ability to apply the principles of evidence-based medicine

PROFESSIONAL

1) Demonstrate the ability of self-evaluation, including insight into strengths and weakness
2) Treat the consulting services, team, and other coworkers with respect and professionalism

6-Trauma Rotation

MEDICAL EXPERT

1) Demonstrate the ability to rapidly and thoroughly assess patients with major and minor trauma by using the advanced trauma life support (ATLS) approach
2) Demonstrate the ability to recognize immediate life-threatening injuries and establish priorities during the initial management of patients with life-threatening trauma
3) Learn to establish treatment priorities in patients with complex illnesses under stressful conditions, as well as to understand the crash protocol
4) Demonstrate the ability to manage the airway of pediatric and/or adult patients with trauma
5) List different airway interventions and discuss the advantages, disadvantages, and complications of each method
6) Demonstrate the ability to manage fluid resuscitation of trauma patients
7) Discus the definitive care of the trauma patient, including the operative, post-operative, and rehabilitative phases of care
8) Demonstrate the ability to interpret plain radiographs of the chest; cervical, thoracic, and lumbar spine; pelvis; and extremity of trauma patients
9) Demonstrate the ability to use and interpret different imaging modalities for the evaluation of trauma patients, including CT, angiography, cystography, and urethrography
10) Demonstrate the ability to conduct and interpret FAST and EFAST
11) Demonstrate the ability to assess and treat facial trauma
12) Demonstrate the ability to evaluate and manage blunt neck injuries
13) Demonstrate the ability to assess blunt chest trauma and develop treatment priorities in stable and unstable patients
14) List the findings of traumatic aortic injury as well as define the advantages, disadvantages, and contraindications of angiography, echocardiography, transesophageal echocardiography, CT, and MRI on the basis of the definition of the injury
15) List the risks for and the signs and symptoms of diaphragmatic injury
16) Assess the abdomen of the blunt trauma patient, including the indications for immediate laparotomy
17) Compare and contrast the use of ultrasound and CT scan for the evaluation of abdominal trauma
18) Demonstrate proficiency in assessing retroperitoneal injuries, including the indications for the use of intravenous pyelography, angiography, and CT
19) Have knowledge about the anatomy of the neck, be able to classify the penetrating trauma by zone, and be able to define the diagnostic and therapeutic interventions required for each region

20) Demonstrate the ability to assess penetrating injuries to the chest and define indications for chest tube placement and open thoracotomy
21) Compare and contrast the types of injuries sustained in gunshot and stab wounds
22) Describe the management of penetrating injuries to the heart and major vessels
23) Demonstrate the ability to assess and treat patients with penetrating abdominal trauma, including indications for immediate laparotomy, CT, and/or observations
24) Define the management of penetrating trauma to the back and flank, including indications and contraindications for wound exploration, radiographic imaging, and surgical exploration
25) Demonstrate the ability to assess urologic injuries in trauma patients, including the indications for IVP, CT, urethrography, and cystography
26) Demonstrate the ability to calculate the Glasgow Coma Score and discuss its role in the evaluation and treatment of head injury patients
27) Demonstrate the ability to use spine immobilization techniques in trauma patients
28) Learn to interpret a head CT scan of trauma patients
29) Discuss the evaluation and management of spinal cord injuries
30) Demonstrate the ability to diagnose and treat pelvic fractures
31) Demonstrate the ability to diagnose and manage tendon injuries
32) Learn to recognize limb-threatening injuries and establish mechanisms to prevent the loss of limbs
33) Demonstrate the ability to manage amputation injuries and discuss the potential for re-implantation
34) Diagnose and manage extremity fractures, dislocations, and subluxations
35) Manage soft tissue injuries, including lacerations, avulsions, and high-pressure injection injuries
36) Discuss the diagnosis and management of compartment syndromes
37) Demonstrate the ability to manage patients with acute burns, including minor and major injuries
38) Demonstrate the ability to diagnose and treat smoke inhalation
39) Demonstrate appropriate use of analgesics and sedatives in trauma patients
40) Demonstrate appropriate use of antibiotics in trauma patients
41) Discuss the importance of mechanisms of injury in the evaluation and treatment of trauma patients
42) Learn the different modes of straining combative traumatic patients
43) Rotation-specific skills
    - Oral intubation
    - Venous cut down
    - Insertion of large-bore peripheral and central venous lines and/or trauma lines
    - Arterial lines
    - Needle and tube thoracostomy
    - Local wound exploration
    - Peritoneal lavage
    - Vessel ligation
    - Repair of simple and complex lacerations
    - Splinting of extremity fractures
    - Reduction and immobilization of joint dislocations, cricothyroidotomy, resuscitative thoracotomy, and pericardiotomy
    - Extensor tendon repair (as feasible)

COMMUNICATOR

1) Demonstrate the ability to effectively and sensitively communicate with seriously injured patients and their families
2) Demonstrate the ability to communicate effectively with members of the trauma team

COLLABORATOR

1) Learn to work within a team to approach a trauma patient and define the fellow's role, possibly playing different roles each time
2) Discuss the role of pre-hospital systems in the management of trauma patients
3) Demonstrate the ability to direct a trauma team during complex resuscitations
4) Demonstrate the ability to coordinate multiple consultants involved in the care of trauma patients
5) Demonstrate the ability to arrange appropriate consultation and disposition of trauma patients

MANAGER

1) Learn principles of disaster management
2) Learn a systematic approach for the management of trauma at the local and provincial levels

HEALTH ADVOCATE

1) Understand the determinants of health and risk factors of injury
2) Understand the rationale and organization of injury prevention initiatives at the local and national levels
3) Demonstrate the ability to counsel patients on injury prevention measures, including using car seat belts

SCHOLAR

1) Demonstrate the ability to critically appraise the literature regarding trauma issues

PROFESSIONAL

1) Demonstrate the ability for self-evaluation, including insight into strengths and weaknesses
2) Demonstrate proficiency in communicating with different consultants in the field of traumatology

7-Research Rotation:

MEDICAL EXPERT

1) Critically appraise the background literature for the research project
2) Demonstrate an understanding of the basic principles of research design, methodology, biostatistics, and clinical epidemiology
3) Demonstrate in-depth knowledge of the research topic of interest

COMMUNICATOR

1) Demonstrate skills in conveying and discussing scientific research on PEM to scientific communities through posters, abstracts, teaching slides, manuscripts, grant applications, or other scientific communications
2) Communicate and collaborate effectively with research team members to conduct the research

COLLABORATOR

1) Identify, consult, and collaborate with appropriate experts to conduct the research

MANAGER

1) Independently identify an area of research interest and a research mentor to engage in the scholarship of scientific inquiry and dissemination
2) Independently utilize available resources and regularly meet with the identified research mentor
3) Demonstrate effective time management in the research setting
4) Demonstrate leadership and administrative abilities, where appropriate, in leading a research team

HEALTH ADVOCATE

1) Recognize the contributions of scientific research in improving the health of patients and communities

SCHOLAR

1) Pose a research question (clinical, basic, or population health)
2) Develop a proposal to solve the research question:
   - Conduct an appropriate literature search based on the question
   - Propose a methodological approach to solve the question
3) Perform the research outlined in the proposal
4) Critically analyze and disseminate the results of the research
5) Identify areas for further research

PROFESSIONAL

1) Uphold ethical and professional expectations of research consistent with institutional review board guidelines, including the maintenance of meticulous data and conduct ethically sound research in human or animal subjects
2) Demonstrate personal responsibility for setting research goals and working with mentors to set and achieve research timeline objectives
3) Participate as much as possible in specialty organizations that promote scholarly activity and continuous professional development
4) Publish accurate and reliable research results, with attention to appropriate authorship attribution criteria
5) Disclose potential financial conflicts of interest (including speaker fees, consultative relationships, and investments) as appropriate when engaging in and disseminating research results

8-PEM Point-of-care Ultrasound (POCUS) Rotation

MEDICAL EXPERT

1) Have knowledge and understanding of the core PEM POCUS applications at a clinically acceptable level;
2) Gain some understanding and familiarity of supplementary ultrasound applications by reading journal articles and via clinical exposure

COMMUNICATOR

1) Be able to converse effectively and appropriately with patients and their families
2) Be able to discuss informed consent and other relevant issues regarding emergency room ultrasound diagnostic and procedural applications
3) Have knowledge of the Healthcare Consent Act
4) Demonstrate sensitivity regarding the backgrounds of patients
5) Demonstrate the ability to deliver bad news effectively with compassion and sensitivity
6) Demonstrate the ability to effectively educate healthcare providers concerning POCUS in PEM

COLLABORATOR

1) Communicate and coordinate with the healthcare team about both short- and long-term therapeutic decisions regarding patients undergoing POCUS
2) Demonstrate the ability to work effectively as part of a healthcare team in the emergency room environment
3) Contribute to the ED's POCUS quality assurance process
4) Demonstrate the ability to effectively utilize institutional personal and resources in scholarly and administrative pursuits

MANAGER

1) Coordinate care for patients using POCUS, including the appropriate utilization of consultants, specialists, and community resources
2) Demonstrate proper documentation involving POCUS in the management of medical patients
3) Demonstrate the ability to manage time efficiently
4) Demonstrate the ability to identify medico-legal risks and take steps to address them
5) Demonstrate an understanding of POCUS program management and leadership

HEALTH ADVOCATE

1) Demonstrate an understanding regarding the determinants of health affecting patients and their families
2) Demonstrate the ability to act as an advocate for the individual patient and affected populations
3) Have knowledge of health policy development
4) Have knowledge of routine preventive health initiatives

SCHOLAR

1) Demonstrate inquisitiveness about clinical cases
2) Demonstrate the ability to apply the principles of evidence-based medicine
3) Demonstrate the ability to mentor junior trainees

PROFESSIONAL

1) Adhere to the code of ethics of the MOH
2) Treat patients and colleagues with respect
3) Demonstrate the ability of self-evaluation, including insight into strengths and weaknesses
4) Demonstrate commitment to lifelong learning
5) Demonstrate the willingness to accept responsibility for one's actions and patient care

RESEARCH

1) Demonstrate the ability to prepare a manuscript for submission to a medical journal
2) Demonstrate the ability to critically evaluate the literature pertaining to POCUS
3) Develop an independent research project from inception to publication

EDUCATION

1) Learn image acquisition and interpretation skills for both basic and advanced emergency and POCUS applications
2) Develop lecturing and teaching skills by developing an emergency ultrasound lecture portfolio and contribute to the program's educational mission

ADMINISTRATION

1) Understand the critical components that are required to run an emergency ultrasound program and how to best utilize information technologies for image archiving, database management, and quality assurance

9-Administrative Rotation

MEDICAL EXPERT

1) Demonstrate a commitment to PEM high-quality care systems
2) Encourage PEM evidence-based practice
3) Perform periodic assessment of healthcare providers who fall under the fellow's supervision
4) Facilitate and provide the needed support to ensure high quality of care
5) Recognize and respond to the complexity, uncertainty, and ambiguity inherent in PEM medical practice
6) Prioritize issues to be addressed in patient encounters
7) Establish patient-centered management protocols
8) Establish policies and procedures to maintain safety of patients and staff
9) Create a culture of openness, feedback, and exchange of experiences
10) Recognize and respond to harm owing to healthcare delivery, including mortality and morbidity as well as risk factor management

COMMUNICATOR

1) Encourage and improve effective inter- and intra-departmental communication
2) Manage disagreements and emotionally charged conversations
3) Provide a clear structure for and manage the flow of an entire patient journey
4) Disclose harmful patient safety incidents to staff, patients, and their families accurately and appropriately, and close system gaps leading to those incidents
5) Communicate effectively using written policies, protocols, memoranda, and approved digital channels
6) Share information with staff, patients, and others in a manner that respects patient privacy and organizational rules

COLLABORATOR

1) Establish and maintain positive relationships with department chairpersons, physicians, and other colleagues in the healthcare professions to support relationship-centered collaborative care
2) Negotiate overlapping and shared responsibilities with physicians and other colleagues in the healthcare professions in episodic and ongoing care
3) Implement strategies to promote understanding, manage differences, and resolve conflicts in a manner that supports a collaborative culture
4) Develop clear policies regarding when care should be transferred to another physician or healthcare professional

LEADER

1) Allocate healthcare resources for optimal patient care
2) Contribute to a culture that promotes patient safety
3) Analyze patient safety incidents to enhance care systems
4) Use health informatics to improve the quality of patient care and optimize patient safety
5) Establish and manage the workforce plan
6) Apply evidence and management processes to achieve cost-appropriate care
7) Demonstrate leadership skills to enhance healthcare
8) Facilitate change in healthcare to enhance services and outcomes
9) Set priorities and manage time to balance practice and personal life
10) Manage a career and practice
11) Implement processes to ensure personal practice improvement
12) Work to hire talented PEM physicians and maintain a high staff retention rate

HEALTH ADVOCATE

1) Build a culture of patient-centered care
2) Work with staff, patients, and their families to increase opportunities to adopt healthy behaviors
3) Encourage staff to incorporate disease prevention, health promotion, and health surveillance into interactions with individual patients
4) Improve clinical practice by applying a process of continuous quality improvement to disease prevention, health promotion, and health surveillance activities

SCHOLAR

1) Develop, implement, monitor, and revise a staff learning plan to enhance professional practice
2) Identify opportunities for learning and improvement by regularly reflecting on and assessing staff performance by using various internal and external data sources
3) Recognize the influence of role-modeling and the impact of formal, informal, and hidden curriculum on learners
4) Promote a safe learning environment
5) Plan and deliver a learning activity
6) Provide feedback to enhance learning and performance
7) Assess and evaluate learners, teachers, and programs in an educationally appropriate manner
8) Recognize practice uncertainty and knowledge gaps in clinical and other professional encounters and generate focused trainings that address them
9) Encourage and critically evaluate the integrity, reliability, and applicability of the healthcare system
10) Integrate evidence into decision-making in staff practice
11) Identify ethical principles for research and incorporate them into staff practice
12) Promote a research environmental orientation

PROFESSIONAL

1) Set standards and support appropriate professional behaviors and relationships
2) Encourage a commitment to excellence in all aspects of practice
3) Support staff to recognize and respond to ethical issues encountered in practice
4) Eliminate and manage conflicts of interest
5) Monitor accountability to patients, society, and the profession by responding to social expectations
6) Assess and manage adherence to professional and ethical codes, standards of practice, and laws governing practice
7) Recognize and respond to unprofessional and unethical behaviors of physicians and other colleagues in the healthcare professions
8) Promote self-awareness, manage influence on personal well-being and professional performance, and eliminate factors contributing to staff burnout
9) Train and ensure staff can manage personal and professional demands for a sustainable practice

2.3 Expected Level of Competency for Core Specialty Level Problems

Each disease, categorized according to the core specialty level, should fall into one of the following four categories:

- Common (C)
- Treatable (T)
- Life, limb, or vision threatening (L)
- Preventable (P)

Each core clinical problem is a cardinal sign or symptom in PEM, and they are categorized into

- Core specialty level
- Mastery level

Core Specialty Level: These are high-priority topics, and trainees are expected to attain competency in comprehensive management of these conditions during the first year of their training.

Mastery Level: These topics are useful to know during the first year of the PEM Fellowship, and trainees are expected to attain competency in managing these conditions during the second year of their training[1].

Mastery Level	Core Specialty Level	Core Clinical Problem[6]
Diverticulitis (C, T) Thyroid storm (T, L, P) Drug fever (T, P) Neuroleptic malignant syndrome (T, L) Transfusion reactions (T, L) Tubo-ovarian abscess (T) Epiglotitis(T, L) Acute Chest Syndrome(T,L) Perinephric Abscess(T,L) Necrotizing Fasciitis(T,L) Toxic Shock Syndrome(T,L) Steven-Johnson Syndrome(C,P,T,L) Malignant Hyperthermia(C,P,T,L) Heat Stroke(C,P,T,L) Serotonin Syndrome(T,P,L)	Neonatal sepsis (C, T, L) Fever over 2–3 months (C, P, T) Meningitis (T, L) Bacterial pneumonia (C, T) Appendicitis (C, T) Cholecystitis (C, T) UTI/pyelonephritis (C, T) Cellulitis (C, T) Encephalitis/brain abscess (T, L) Cystitis, epididymitis (T) ENT infections (pharyngitis, otitis media, sinusitis, peritonsillar abscess) (C, T) Sepsis syndrome (C, T, L, P) Septic arthritis/osteomyelitis (C, T) Brucellosis (C, T, P) Malignancy (T) Myocarditis (T, L) Pericarditis (T, L) Rheumatic heart disease (T, P) SCA with fever (C, T, L) Acute bronchiolitis (C, T) Croup (C, T) Bacterial tracheitis (T, L)	*Fever*

Mastery Level	Core Specialty Level	Core Clinical Problem
Pseudotumor cerebri (L) Temporal arteritis (T, L) Hypertensive crisis (T, L) Acute mountain sickness (T, P) Cerebellar venous sinus thrombosis (T,L) Arterial Disection(T,L)	Subarachnoid hemorrhage (C, L) Hypertension (C,P,T, L) Subdural hematoma (C, L) Meningitis/encephalitis/CNS abscess (T, L) Increased intracranial pressure (T, L) Brain Tumor (C,T,L) CO poisoning (T, L, P) Headaches/ migraines (C, T, P) Concussion (T, P) Post-lumbar headache (T, P) Hydrocephalus(C,P,T,L)	*Headache*

Mastery Level	Core Specialty Level	Core Clinical Problem
Diphtheria (T) Tetanus (T, L, P) Tick paralysis (T) Cord Compression(T,L) Epidural Hematoma (T,L) Spinal cord trauma (L, P)	Metabolic disorder (C, T, P) Electrolyte imbalance (C, T, L, P) Botulism (T, L, P) Myasthenia gravis(T, L, P) Guillain-Barré Syndrome (T, L, P) Carbamate Poisoning(P, T) Organophosphate (C, T, P) Transverse myelitis (L) Polymyositis (L) Spinal Muscular Atrophy(C, T) Snake bite(C, P, T, L)	*Weakness*

Mastery Level	Core Specialty Level	Core Clinical Problem
Fat embolism (L) Hepatic failure (C, L) Hypertensive encephalopathy (T, L, P) Heat stroke (L,T,P) Cerebral venous sinus thrombosis(T,L)	CNS infection (T, L, P) Electrolyte imbalance (C, T, L, P) Trauma (subdural/epidural hematoma, cerebral concussion/contusion(C, L, P) Subarachnoid hemorrhage (L)	*Depressed consciousness and coma*
Pheochromocytoma (L)	Intracerebral hemorrhage (L)	
High-altitude cerebral edema (L)	Intoxication (C, T, L, P)	
Cerebral pontine myelinolysis (L, P)	Endocrine disorders:	
Co-factor deficiency (thiamine,	(hypo/hyperglycemia, thyrotoxicosis,	
Pyridoxine(T,L,P)	Cushing's syndrome;	
Hypertensive Crises(T,P,L)	(C, T, L, P)	
Pontine hemorrhage (L)	Hypovolemic Shock (C, T, L)	
	Stroke (C, L)	
	Brain Tumor(C,T,L)	
Cerebral lupus vasculitis	Acute hydrocephalus (L)	
Malignant hyperthermia (L)		
Porphyria (L)	Metabolic Disease (T, L) Bleeding disorder (C, T, L)	

Mastery Level	Core Specialty Level	Core Clinical Problem
Tetanus (T, P) Camphor/TCA/Cocaine poisoning (L, P) Phencyclidine overdose (P) Hemiparetic migraine (T, L) Tics (T, L) Alcohol poisoning(C,P,T,L) Long QT syndrome (T, L)	Metabolic Disease (T, L) Electrolyte disturbances (C, T, L, P) Epilepsy/status epilepticus (C, T, L, P) Neonatal seizure (C, T, L) CNS infection(C,P,T,L) Panic attacks (C) Transient ischemic attack (C, T, P) Hypoglycemia (C, T, L, P) Extrapyramidal reaction (C, T, P) Febrile Sezure(C,T,P,L)	*Seizure*

Mastery Level	Core Specialty Level	Core Clinical Problem
Tension Pneumothorax (T, L) Diaphragmatic Rupture (T, L) Acute Chest Syndrome (T, L) Flial Chest (T, L) Epiglititis (T, L) Cardiac Tomponade (L) Tumor (T, L) Pneumomediastenum (T, L)	Asthma (C, T, L, P) Aspiration pneumonia (C, L, P) Toxic inhalation/ingestion (T, L, P) Airway obstruction (L) Acute bronchiolitis (C, T) Organophosphate poisoning (L, P) Pulmonary edema (C, T, L, P) Electrolyte imbalance (C, T, L, P) FB inhalation (C, P, L) Peri/myocarditis (T, L) Cardiomyopathy (T, L) Anaphylaxis (C, P, T, L)	*Dyspnea*

Mastery Level	Core Specialty Level	Core Clinical Problem
Basilar artery migraine (L) Pacemaker/implantable cardioverter defibrillator malfunction (C, T, P) Conversion Disorder (C, T, P, L) Medication side effect (C, P) Psychogenic (conversion, somatization, anxiety C, T) Brugada Syndrome (T, L) Pulmonary Hypertension (C, T, L) Inhalant Abuse (T, P, L) Postoperative Cardiac Repair (C, T, L, P) Heat Syncope (T, L)	Subarachnoid hemorrhage (L) Hypovolemic (C, T, L, P) Valvular heart disease (T, L) Arrhythmia (Wolff–Parkinson–White syndrome, ventricular fibrillation, supraventricular tachycardia, long QT, atrioventricular block; C, T, L, P) Hypoglycemia (C, T, L, P) Seizure (T, C) Intoxication (C, T, L, P) Anaphylaxis (T, L) Cardiomyopathy (C, T)	*Syncope*

Mastery Level	Core Specialty Level	Core Clinical Problem
Myopathic (scleroderma, multiple sclerosis (C, T, L) Uremia (T, L, P) Cerebrovascular accident (C, L, T) Anorexia Nervosa (T, L, P) Sexual Abuse (T, L, P) Infantile Botulism (T, L) Spinal Cord Injury (T, L)	FunctionalConstipation(C,P,T); Anal Fissure (C, T,P) Medication side effects (opiates, antacids, antidepressants, iron (C, T, P) Hirschsprung Disease (C, P, T, L) Electrolyte imbalance (hypocalcemia, hypokalemia, hypomagnesemia; (C, T, L, P) Inflamatory Bowl Disease (C, T, L, P) Imperforated Anus (T, L) Meconium Ileus (T, L) Mechanical Obstruction (T, L, P) Abdominal/Pelvic Mass (T, L)	*Constipation*

Mastery Level	Core Specialty Level	Core Clinical Problem
Esophageal rupture (L) Mediastinitis (L) Pulmonary embolism (L, T) Pneumomediastinitis (T, L) Post-herpetic neuralgia (T, L) Aortic dissection (T, L) Cardiac tamponade (T, L) Arryhethmia (T, L)	Pneumonia (C, T) Gastroesophageal reflux disease (C, T) Peri/myocarditis (L, C) Trauma (flail chest; T) Muscle strain (C, T) Pneumothorax (C, T, L) Mallory–Weiss tear (C, T) Valvular heart disease (T, L) Hypertrophic cardiomyopathy (C, T, L) Pancreatitis (T, L) Peptic ulcer disease (T) Acute chest syndrome (C, T, L) Costochondritis (C, T) Acute Asthma (C, T, L, P) FB Aspiration (C, T, L, P) Cystic Fibrosis (C, T, L) Cardiogenic Shock (T, L)	*Chest pain*

Mastery Level	Core Specialty Level	Core Clinical Problem
Uremia (T, L, P) Drug withdrawal (T, L) Labyrinthitis (C) Adrenal insufficiency (T, L) Spontaneous bacterial peritonitis (T, L) Incarcerated Hernia(C,T,L)	Peritonitis (L) Diabeticketoacidosis (C,T, L,P) Meningitis (T, L) Gastroenteritis (C, T, P) Sepsis (C, T, L) Raised intracranial pressure (T, L) CNS tumor (C, T, L) Malrotation/Volvulus (C, T, L) Necrotizing Enterocolitis (T, L)	*Nausea and vomiting*

	Pyloric stenosis (C, T) Gonadal torsion (T, L) Electrolyte disorders (C, T, L, P) Inborn Error of Metabolism (C, T, L) Motion sickness (C, T) Biliary colic (C, T) Pancreatitis (T, L) Appendicitis (C, T) Congenital adrenal hyperplasia (T, L) Peptic ulcer disease (C, T) Pyelonephritis (T) Renal colic (C, T) Bowel obstruction (T) Cholecystitis/cholangitis (C, T) Hepatitis (C, P) Drug toxicity (aspirin, digoxin, acetaminophen; C, T, L, P)	

Mastery Level	**Core Specialty Level**	**Core Clinical Problem**
Diverticulitis (T) Vasculitis (L) Rocky Mountain spotted fever (T) Muscle hematoma (T) Snake/black widow spider bite (C, T, L) Heavy metal toxicity (T, P) Hemolytic Uremic Syndrome (T, L) Child abuse (T, L, P) Aortic Aneurysm (T, L) Megacolon (T, P, L)	Diabeticketoacidosis (C, T, L, P) Constipation (C, T, P) Gastritis/gastroenteritis (C, T, P, L) Splenic sequestration (T, L) Biliary tract disease (C, T) Acute appendicitis (C, T) Intussusception (T, L) Mesenteric ischemia (L) Viscus perforation (T, L) Intestinal obstruction (C, T) Pancreatitis (C, L) Pyelonephritis (C, T) Renal colic (C, T, P) Ovarian torsion (T, L) Testicular torsion (T, L) Mesenteric lymphadenitis (T) Trauma (C, P, T, L)	*Abdominal pain*

Mastery Level	**Core Specialty Level**	**Core Clinical Problem**
Fish-associated toxins (P, L) Radiation therapy Poisoning (T, P, L) Intestinal Lymphangiectasia (T) Short Bowl Syndrome (T, L)	Infectious diarrhea (viral, parasitic, invasive bacterial, toxigenic (C, T, P, L) Systemic disease (Henoch–Schönlein purpura, hemolytic-uremic syndrome, lymphoma, cystic fibrosis, Celiac Disease (C, T, L) Drug-induced (non-steroidal anti- inflammatory drugs, digitalis, antibiotics (C, T)	*Diarrhea*

Secretory Neoplasms (T, L) Toxic Megacolon (T, L)	Gastrointestinal pathology (gastrointestinal bleed, cirrhosis, malrotation, Hirschsprung's disease (C, T, L) Intussusception (T, L) Food Allergy (C, P, T, L)	

Mastery Level	Core Specialty Level	Core Clinical Problem
Budd-Chiari syndrome (T, L) Wilson's disease (T, L) Drug induced Hemolysis (T, L) Reye's syndrome (L) Liver transplant rejection (L) Autoimmune Hemolytic Anemia (T, L)	Physiological neonatal jaundice (C, T) Hepatitis (C, L, P) Cholangitis (T, L) Transfusion reaction (T, P, L) Hemolytic anemia (T, L) Gilbert's syndrome (T) Urinary tract infection (C, T, P) Biliary atresia (T) Inborn errors of metabolism (C, T, L)	*Jaundice*

Mastery Level	Core Specialty Level	Core Clinical Problem
Sexual abuse (T, P, L)	Vaginal FBs (C, T, P) Trauma (C, P, T) Bleeding disorder (T, L)	*Vaginal bleeding*

Mastery Level	Core Specialty Level	Core Clinical Problem
Epidural abscess/hematoma (T, L) Spinal stenosis (T) Transverse myelitis (T, L) Vertebral Osteomyelitis (T, L) Ankylosing spondylitis (T) Spondylolisthesis (T)	Malignancy (T, L) Peptic ulcer disease (C, T) Cholecystitis (C, T) Ovarian torsion/cyst (T) Pyelonephritis (C, T) Spinal fracture/subluxation (P.T,L) Muscle strain (C, T) Degenerative joint disease (T) Intervertebral disc disease (T) Pancreatitis (T, L) Retroperitoneal mass/hemorrhage (T, L) Sickle cell anemia (C, T, L)	*Back pain*

Mastery Level	Core Specialty Level	Core Clinical Problem
Peritonsillar cellulitis/Abscess (T, L) Uvulitis (T, L) Lemierre Syndrome (T, L)	Epiglottitis (T, L) Ludwig's angina (T, L) Tracheitis (T, L) Lingual abscess (T, L) Tumor (T, L) FBs (T, L, P) Trauma (C, T, P, L) Caustic ingestion (L, P) Congenital anomaly (T) Tonsillitis (C, T) Pharyngitis (C, T) Retropharyngeal abscess (T, L) Parapharyngeal abscess (T, L)	*Sore throat*

Mastery Level	Core Specialty Level	Core Clinical Problem
Gastricerosions (C,T) Esophagitis (C, T) Esophageal Varices (T, L) Portal hypertension (T, L) Vascular Malformation (T, L) Intestinal Duplication (T, L) Ischemic Colitis (T, L) Toxic Megacolon (T, L)	Anal fissure (C, T) Infectious colitis (C, T, P) Mallory–Weiss tear (C, T) Intussusception (T, L) Polyp (T) Diverticulosis (T) Inflammatory bowel disease (C, T, L) Peptic ulcer disease (C, T, L) Bleeding disorder (C, T, L) Necrotizing Enterocolitis (T, L) Pseudomembranous Enterocolotis (C, P, T)	*Gastrointestinal bleeding*

Mastery Level	Core Specialty Level	Core Clinical Problem
Vasculitis (T, L) Arteriovenous malformation (T, L) Tracheal-arterial fistula (T, L) Pulmonary embolism (T, L) Aortic aneurysm (T, L) Idiopathic Pulmonary Hemosiderosis (T, L)	Bronchiectasis (C, T, L) Neoplasm (L) Traumatic FBs (C, T, L) Tuberculosis (T, L) Pneumonia/lung abscess (C, T) Endocarditis (T, L) Disseminated intravascular coagulation (T, L) Coagulopathy (T, L) Pulmonary hypertension (C, T) Congenital heart disease (T, L)	*Hemoptysis*

Mastery Level	Core Specialty Level	Core Clinical Problem
Retrobulbar emphysema (T, L) Retrobulbar abscess (T, L) Endophthalmitis (L) Child abuse (T, L) Juvenile Rheumatoid Artheritis (T, L) Vitamin A Defeciency (T) Stevens-Johnson Syndrome (T, L) Cystinosis (T, L) Leukemia (T, L)	Conjunctivitis (C, T, P) Peril/orbital cellulitis (C, T, L) Caustic keratoconjunctivitis (T, L, P) Blepharitis (C, T) Chalazion (C, T) Dacryocystitis/dacryoadenitis (T) Orbital tumor (T, L) Hordeolum (T) Retrobulbar hematoma (T, L) Hyphema (T, L) Ruptured globe (T, L) Glaucoma (T, L) Uveitis (T) Scleritis (T) Episcleritis (T) Subconjunctival hemorrhage (C, T) Keratitis (C, T, P)	*Red and painful eye*

Mastery Level	Core Specialty Level	Core Clinical Problem
Arteriovenous fistula (C, T, P) Tension Pneumothorax (T, L) Massive Hemothorax (T, L) Pulmonary Hemorrhage (T, L) Pulmonary Embolism (T, L) Diaphragmatic Hernia (T, L) Congenital Hypoplasia (T)	Cyanotic heart disease (C, T, L) Acute respiratory distress syndrome (C, T, L) Pneumonia (C, T, L) Upper airway obstruction (T, L) Methemoglobinemia (T, L) Hypoventilation (C, T) Pulmonary hypertension (T, P) Pneumothorax (T, L) Cardiogenic Shock (T, L) Septic Shock (T, L) Drug ingestion (T, L, P) Polycythemia (T)	*Cyanosis*

Mastery Level	Core Specialty Level	Core Clinical Problem
Thrombotic thrombocytopenic purpura (T, L) Tinea infections (C, T, P) Toxic epidermal necrolysis (L, T) Primary blistering disorders (pemphigus and pemphigoid;(T, L) Rocky Mountain spotted fever (T)	Rash differential diagnoses (exanthema, maculopapular, erythematous, petechial, purpuric, vesicular rash (C, T, L, P) Erythema multiforme (C, T, L) Meningococcemia (L, T, P) Allergic reaction/urticaria/eczema (C, T, L, P) Shingles (C, T)	*Rash*

Biological warfare (small pox, anthrax, plague; L) Lyme disease (T) Steven Johnson's syndrome (T, L) Toxic shock syndrome (L, T) Erythema nodosum (C, T) Vasculitis (C, T, L)	Herpes simplex (C, T) Pityriasis rosea (T) Chicken pox (C, T) Measles (C, T, P) Rheumatic heart disease (T) Immune thrombocytopenic purpura (T) Rheumatic heart disease (T) Psoriasis (C)	

UTI = urinary tract infection; ENT = ear, nose, throat; SCA = sickle cell anemia

2.4 PEDIATRIC EMERGENCY MEDICINE TRAINING PROGRAM MILESTONES[7-10]

General Training Mapping

1. Emergency Stabilization

The fellow prioritizes critical initial stabilization action and mobilizes hospital support services for the resuscitation of critically ill or injured patients, with reassessment after the stabilizing intervention.

F2	F1
• Recognizes, in a timely fashion, when further clinical intervention is futile • Integrates hospital support services into a management strategy for problematic stabilization situations • Evaluates the validity of a do- not-resuscitate order • Develops policies and protocols for the management and/or transfer of critically ill or injured patients	• Recognizes abnormal vital signs • Recognizes situations in which a patient is unstable and requires immediate intervention • Performs a primary assessment of a critically ill or injured patient • Discerns relevant data to formulate a diagnostic impression and plan • Manages and prioritizes critically ill or injured patients

	• Prioritizes critical initial stabilization action in the resuscitation of a critically ill or injured patient • Performs a reassessment after implementing a stabilizing intervention
Suggested evaluation methods: e.g.ITER, direct observation of procedural skills (DOPS), observed resuscitation, simulation, Mini-CEX, and multisource feedback	

2. Performance of Focused History and Physical Examinations

The fellow summarizes the current findings of patients with multiple chronic medical problems, and when appropriate, compares findings with prior medical records and identifies significant differences between current and past presentation.

F2	F1
• Synthesizes essential data necessary for the correct management of patients using all potential data sources • Identifies obscure, occult, or rare patient conditions based solely on historical and physical examination findings	• Obtains focused history and performs physical examination, which effectively addresses the chief complaint and urgent patient issues • Prioritizes essential components of a history, given limited or dynamic circumstances • Prioritizes essential components of a physical examination, given limited or dynamic circumstances
Suggested evaluation methods: DOPE, ITER, Mini-CEX, case-based discussion, standardized examinations, and simulation	

3. Diagnostic Studies

The fellow applies the results of diagnostic testing based on the probability of disease and the likelihood that test results will alter management.

F2	F1
• Practices cost-effective ordering of diagnostic studies • Understands the implications of false positives and negatives for post-test probability • Uses diagnostic testing based on pre-test probability of disease and the likelihood that the test results will alter management • Discriminates between subtle and conflicting diagnostic results considering patient presentation	• Determines the necessity of diagnostic studies • Orders appropriate diagnostic studies • Performs appropriate bedside diagnostic studies and procedures • Prioritizes essential testing • Interprets results of a diagnostic study, recognizes limitations and risks, and seeks interpretive assistance as appropriate • Reviews risks, benefits, contraindications, and alternatives to a diagnostic study or procedure
Suggested evaluation methods: ITER, DOPE, Mini-CEX, case-based discussion standardized examinations, and simulation	

4. Diagnosis

Based on all of the available data, the fellow narrows and prioritizes the list of weighted differential diagnoses to determine appropriate management.

F2	F1
• Synthesizes all of the available data and narrows and prioritizes the list of weighted differential diagnoses to determine appropriate management	• Constructs a list of potential diagnoses based on the chief complaint and initial assessment

• Uses pattern recognition to identify discriminating features between similar patients and avoids premature closure	• Prioritizes a list of potential diagnoses based on the greatest likelihood of occurrence • Uses all available medical information to develop a list of ranked differential diagnoses, including those with the greatest potential for morbidity or mortality • Correctly identifies "sick versus well" patients • Revises the differential diagnosis in response to changes in a patient's course over time
Suggested evaluation methods: ITER, DOPE, Mini-CEX, simulation, and case-based discussion.	

5. Pharmacotherapy

The fellow selects and prescribes appropriate pharmaceutical agents based upon relevant considerations, such as the mechanism of action, intended effect, financial considerations, possible adverse effects, patient preferences, allergies, potential drug-food and drug-drug interactions, institutional policies, and clinical guidelines; the fellow effectively combines agents and monitors and intervenes in the advent of adverse effects in the ED.

F2	F1
• Selects the appropriate agent based on the mechanism of action, intended effect, possible adverse effects, patient preferences, allergies, potential drug-food and drug-drug interactions, financial considerations, institutional policies, and clinical guidelines; considerations	• Knows the different classifications of pharmacologic agents and their mechanisms of action • Consistently asks patients about drug allergies • Considers an array of drug therapy for treatment; selects

include patient's age, weight, and other modifying factors • Participates in developing institutional policies on pharmacy and therapeutics	appropriate agents based on the mechanism of action and intended effect, and anticipates potential adverse side effects • Considers and recognizes potential drug- drug interactions
Suggested evaluation methods: ITER, DOPE, portfolio, simulation, and medical knowledge examinations	

6. Observation and Reassessment

The fellow re-evaluates patients undergoing ED observation and monitoring, and using appropriate data and resources, determines the differential diagnosis, treatment plan, and disposition.

F2	F1
• Considers additional diagnoses and therapies for patients under observation and changes treatment plans accordingly • Identifies and complies with government and other regulatory requirements, which must be met for patients under observation • Develops protocols to avoid potential complications in interventions and therapies	• Recognizes the need for patient revaluation • Identifies patients who require observation in the ED • Evaluates the effectiveness of therapies and treatments administered during observation • Monitors the patient's clinical status at timely intervals during his/her stay in the ED
Suggested evaluation methods: DOPE, Mini-CEX, multisource feedback, and simulation	

7. Disposition

The fellow establishes and implements a comprehensive disposition plan that uses appropriate consultation resources, and helps in patient education regarding diagnosis, treatment plans, medications, and time- and location-specific disposition instructions.

F2	F1
• Formulates suitable admission plans or discharge instructions, including future diagnostic or therapeutic interventions for ED patients • Engages patients or surrogates in the effective implementation of a discharge plan • Works within the institution to develop hospital systems that enhances safe patient disposition and maximizes the use of resources	• Describes basic resources available for the care of patients in the ED • Formulates and provides patient education regarding diagnosis, treatment plans, medication review, and primary care physician (PCP)/consultant appointments for patients in complicated cases • Involves appropriate resources (e.g., PCP/consultant or social worker) in a timely manner • Makes correct decisions regarding the admission or discharge of patients and correctly assigns admitted patients to an appropriate level of care (intensive care/telemetry/ • floor/observation unit)
Suggested evaluation methods: ITER, DOPE, Mini-CEX, shift evaluations, simulation cases/objective structured clinical examination (OSCE), and multisource feedback	

8. Multitasking (Task-Switching)

The fellow employs task-switching in an efficient and timely manner in order to manage the ED.

F2	F1
• Employs task-switching in an efficient and timely manner in order to manage the ED • Employs task-switching in an efficient and timely manner to manage the ED under high- volume or surge situations	• Manages a single patient amidst distractions • Employs task-switching in an efficient and timely manner in order to manage multiple patients
Suggested evaluation methods: simulation, mock oral examination, DOPE, Mini-CEX, and multisource feedback	

9. General Approach to Procedures

The fellow performs the procedures indicated for all appropriate patients (including those who are uncooperative, those included in different pediatric age groups, those who are hemodynamically unstable, and those who have multiple comorbidities, poorly defined anatomy, a high risk of pain or procedural complications, or require sedation), takes steps to avoid potential complications, and recognizes the outcome and/or complications resulting from the procedure.

F2	F1
• Performs indicated procedures for patients with challenging features (e.g., poorly identifiable landmarks, extreme age, or those with comorbid conditions) • Performs the indicated procedure, takes steps to avoid potential complications, and recognizes the outcome and/or complications resulting from the procedure	• Performs patient assessment, obtains informed consent, and ensures that monitoring equipment is in place in accordance with patient safety standards • Uses appropriate universal precautions

• Teaches procedural competency and corrects mistakes	• Performs the indicated common procedure with moderate urgency for a patient who has identifiable landmarks and a low to moderate risk of complications • Performs post-procedural assessment and identifies any potential complications • Determines a backup strategy in case initial attempts to perform a procedure are unsuccessful • Correctly interprets the results of diagnostic procedures
Suggested evaluation methods: DOPE, Mini-CEX, simulation, OSCE, shift evaluation and ITER.	

10. Airway Management

The fellow performs airway management for all appropriate pediatric patients (including those who are uncooperative, extremely pre-term, hemodynamically unstable, or have multiple comorbidities; those with poorly defined anatomy; those at a high risk of pain or procedural complications; or those requiring sedation), takes steps to avoid potential complications, and recognizes the outcome and/or complications resulting from the procedure.

F2	F1
• Performs airway management under all circumstances, taking steps to avoid potential complications, and recognizes the outcomes and/or complications resulting from the procedure • Performs intubations in a minimum of 40 times during his/her fellowship	• Describes upper airway anatomy • Describes elements of airway assessment and indications that affect airway management • Describes the pharmacology of agents used for rapid sequence intubation, including specific indications and contraindications

• Demonstrates the ability to perform a cricothyrotomy • Uses advanced airway modalities for patients with complicated airway • Teaches airway management skills to healthcare providers	• Performs basic airway maneuvers or adjuncts (jaw thrust/chin lift/oral airway/ nasopharyngeal airway) and ventilates or oxygenates patients using BVM ventilation • Performs rapid sequence intubation in patients with or without adjuncts • Uses airway algorithms in decision-making for patients, with complicated airway ,employing airway adjuncts as indicated • Implements post-intubation management • Employs appropriate methods of mechanical ventilation based on specific patient physiology
Suggested evaluation methods: DOPE, Mini-CEX, procedure logbook, OSCE, shift evaluation,and simulation	

11. Anesthesia and Acute Pain Management

The fellow provides safe acute pain management, anesthesia, and procedural sedation to pediatric patients of all ages, regardless of the clinical situation

F2	F1
• Performs procedural sedation, provides effective sedation with the least risk of complications and minimal recovery time considering selective dosing, the most appropriate route, and the choice of medication	• Knows the indications, contraindications, potential complications, and appropriate doses for medications used for procedural sedation

• Develops pain management protocols and care plans • Teaches procedure sedation and analgesia skills to healthcare providers	• Knows the anatomic landmarks, indications, contraindications, potential complications, and appropriate doses of local anesthetics used for regional anesthesia • Performs patient assessment, discusses the most appropriate analgesic/sedative medication with the patients and families, and administers the most appropriate dose via the best route • Administers local anesthesia using appropriate doses of the local anesthetic and appropriate techniques to provide skin or subdermal anesthesia for procedures • Ensures appropriate monitoring of patients during procedural sedation
Suggested evaluation methods: DOPE, Mini-CEX, procedure logbook, OSCE, shift evaluation, and simulation	

12. Other Diagnostic and Therapeutic Procedures: Goal-directed Focused Ultrasound (Diagnostic/Procedural)

The fellow uses goal-directed focused ultrasound for the bedside diagnostic evaluation of emergency medical conditions and diagnoses, resuscitation of the acutely ill or injured patient, and procedural guidance.

F2	F1
• Performs a minimum of 30 focused ultrasound examinations during his/her fellowship. • Expands ultrasonography skills to include advanced echocardiography; transesophageal echocardiography; bowel, adnexal, and testicular pathology; and transcranial Doppler (see the objectives under PEM-POCUS rotation)	• Describes the indications for emergency ultrasound • Explains how to optimize ultrasound images and identifies the proper probe for each of the focused ultrasound applications • Performs goal-directed focused ultrasound examinations • Correctly interprets acquired images
Suggested evaluation methods: ITER,DOPE, Mini-CEX, procedure logbook, OSCE, shift evaluation, and simulation	

13. Other Diagnostic and Therapeutic Procedures: Wound Management

The fellow assesses and manages wounds in patients of all pediatric ages appropriately, regardless of the clinical situation.

F2	F1
• Achieves hemostasis in a bleeding wound by using advanced techniques such as cautery, ligation, deep suture, injection, topical hemostatic agents, and tourniquets • Repairs wounds that are at high risk of causing cosmetic complications	• Prepares a simple wound for suturing (identifies appropriate suture material,anesthetizes the wound and irrigates it) • Demonstrates sterile techniques

(such as those in the eyelid margin, nose, or ear) • Describes indications and procedures for escharotomy		• Uses medical terminology to clearly describe and classify a wound (e.g., stellate, abrasion, avulsion, laceration, deep vs. superficial) • Classifies burns according to depth and body surface area • Compares and contrasts modes of wound management (adhesives, steri-strips, hair appositions, and staples) • Places a simple interrupted suture • Identifies wounds that require antibiotics or tetanus prophylaxis • Educates patients and families regarding appropriate outpatient wound management • Performs complex wound repairs (deep sutures, layered repair, or corner stitch) • Manages severe burns • Determines which wounds should not be closed • Demonstrates the appropriate use of consultants • Identifies wounds that may be high risk and require more extensive evaluation (e.g., radiography, ultrasound, and/or exploration)
Suggested evaluation methods: ITER, DOPE, Mini-CEX, procedure logbook, OSCE, shift evaluation and simulation, portfolio, and MCQs		

14. Other Diagnostic and Therapeutic Procedures: Vascular Access

The fellow successfully obtains vascular access in patients of all ages, regardless of the clinical situation.

F2	F1
• Inserts a central venous catheter without ultrasound when appropriate • Places an ultrasound-guided deep vein catheter (e.g., in the basilic, brachial, or cephalic veins) • Successfully places 20 intraosseous access during his/her fellowship. • Routinely gains venous access in patients with difficult vascular access • Teaches advanced vascular access techniques	• Performs venipuncture • Places a peripheral intravenous line • Performs arterial puncture • Describes the indications, contraindications, anticipated undesirable outcomes, and complications of various vascular access modalities • Assesses indications in conjunction with the patient's anatomy/patho-physiology and selects the optimal site for a central venous catheter • Inserts a central venous catheter by using ultrasound and while taking universal precautions • Confirms appropriate placement of a central venous catheter • Performs intraosseous access
Suggested evaluation methods: DOPE, Mini-CEX, procedure logbook, OSCE, shift evaluation, simulation, and MCQS	

15. Medical Knowledge

The fellow demonstrates appropriate medical knowledge regarding the care of emergency medicine patients.

F2	F1
• Successfully completes all objective fellowship training program examinations and assessments, in order to get "Certification of Training Completion" • Succefully pass final written and clinical exam developed by SCFHS, achieving appropriate score in order to get "Pediatric Emergency Medicine Saudi Fellowship certificate."	• Completes the objective fellowship training program examinations and/or assessments, achieving an acceptable score for specific rotations • Demonstrates improvement in the proportion of correct answers in the training examination or maintains an acceptable percentile ranking • Passes promotion (end-of-year/in- training) examination, achieving an appropriate score
Suggested evaluation methods: FITER, promotion examination, Saudi Board OSCE (developed by the SCFHS), question and answer bank tests, and local fellowship examinations	

16. Professional Values

The fellow demonstrates compassion, integrity, and respect for others, as well as adherence to the ethical principles relevant to the practice of medicine.

F2	F1
• Develops and applies a consistent and appropriate approach to evaluate appropriate care and remove possible barriers, as well as develop intervention strategies, while consistently prioritizing the patient's best interest in all relationships and situations • Effectively analyzes and manages ethical issues in complicated and challenging clinical situations • Develops institutional and organizational strategies to protect and maintain professional and bioethical principles	• Demonstrates behavior that conveys caring, honesty, genuine interest, and tolerance when interacting with a diverse population of patients and their families • Recognizes how personal beliefs and values affect medical care and consistently manages his/her own values and beliefs to optimize relationships and medical care • Develops alternate care plans when patients' personal decisions/beliefs preclude the use of commonly accepted practices
Suggested evaluation methods: DOPE, Mini-CEX, logbook, OSCE, shift evaluation, ITER and simulation	

17. Accountability

The fellow demonstrates accountability to patients, society, the medical profession, and themselves.

F2	F1
• Is able to form a plan to address impairment in oneself or a colleague in a professional and confidential manner • Consistently recognizes his/her own limits regarding knowledge of uncommon and complicated clinical situations; develops and implements plans to ensure the best possible patient care • Recognizes and avoids the inappropriate influence of marketing and advertising • Manages medical errors according to the principles of responsibility and accountability, in accordance with institutional policy • Develops institutional and organizational strategies to improve physician insight into and management of professional responsibility • Trains physicians and educators regarding responsibility, wellness, fatigue, and physician impairment	• Demonstrates basic professional responsibilities such as reporting for duty in a timely manner, appropriate dressing/grooming, being rested and ready to work, and delivery of patient care as a functional physician • Maintains patient confidentially • Uses social media ethically and responsibly • Adheres to professional responsibilities such as conference attendance, timely chart completion, duty hour reporting, and procedure reporting • Consistently recognizes his/her own limits regarding knowledge in common and frequent clinical situations and asks for assistance • Demonstrates knowledge of alertness, management, and fatigue mitigation principles
Suggested evaluation methods: ITER, DOPE, Mini-CEX, logbook, OSCE, shift evaluation, and simulation	

18. Patient-centered Communication

The fellow demonstrates interpersonal and communication skills that result in effective exchange of information and collaboration with patients and their families.

F2	F1
• Establishes optimal rapport and communicates effectively, rapidly, and accurately under all circumstances • Maintains effective professional and patient-centered communication in a complex environment • Uses flexible communication strategies and adjusts them according to the clinical situation to resolve specific ED challenges, such as delivering bad news, unexpected outcomes, medical errors, and high-risk refusal of patients care • Expands their repertoire of skills to be able to communicate in most circumstances • Teaches patient- centered communication • Participates in the review and counsel of colleagues with communication deficiencies	• Establishes a rapport with and demonstrates empathy toward patients and their defined family units • Listens effectively to patients and their defined family units • Communicates clearly and accurately with patients and colleagues in all situations • Elicits patients' reasons for seeking healthcare and expectations of the ED visit • Negotiates and manages simple patient/family-related conflicts • Communicates effectively with vulnerable populations, including patients at risk and their defined family units • Recognizes, stabilizes, and seeks further advice in difficult communication situations, including those involving the delivery of bad news with empathy • Begins to learn strategies to communicate in difficult situations • Demonstrates accurate and concise written communication skills
Suggested evaluation methods: DOPE, Mini-CEX, logbook, OSCE, shift evaluation, ITER and simulation	

19. Team Management

Fellows lead patient-centered care teams, ensuring effective communication and mutual respect between members of the team.

F2	F1
• Uses flexible communication strategies to resolve specific ED challenges, such as difficulties with consultants and other healthcare providers • Communicates with out-of-hospital and nonmedical personnel, such as the police, media, and hospital administrators • Participates in and leads interdepartmental groups in the patient setting and collaborative meetings outside of the patient care setting • Designs patient care teams and evaluates their performance • Seeks leadership opportunities within professional organizations	• Participates as a member of a patient care team • Develops working relationships across specialties and with ancillary staff • Ensures that transition of care is communicated accurately and efficiently • Ensures clear communication and respect among team members • Recommends changes in team performance as necessary for optimal efficiency
Suggested evaluation methods: ITER,DOPE, Mini-CEX, logbook, OSCE, shift evaluation, and simulation	

20. Practice-based Performance Improvement

The fellow participates in performance improvement to optimize ED function, self-learning, and patient care.

F2	F1
• Applies performance improvement methodologies • Demonstrates mastery of evidence-based clinical practice and information retrieval • Participates in a process improvement plan to optimize ED practice • Independently teaches evidence- based medicine and information mastery techniques	• Describes basic principles of evidence-based medicine • Performs patient follow-up • Performs self-assessment to identify areas for continued self-improvement and implements learning plans • Continually assesses performance by evaluating feedback and assessment • Demonstrates the ability to critically appraise scientific literature and apply evidence-based medicine to improve individual performance
Suggested evaluation methods: DOPE, Mini-CEX, logbook, OSCE, shift evaluation, simulation, and ITER	

21. Patient Safety

The fellow ensures performance improvement to optimize patient safety.

F2	F1
• Leads team reflection—such as code debriefings, root cause analysis, or mortality and morbidity analysis—to improve ED performance • Identifies situations in which a breakdown in teamwork or communication may contribute to medical error • Uses analytical tools to assess healthcare quality and safety and reassess quality improvement programs for the effectiveness in particular patients and populations • Develops and evaluates measures of professional performance and process improvement and implements them to improve departmental practice	• Adheres to the standards for maintenance of a safe working environment • Describes medical errors and adverse events • Routinely uses basic patient safety practices such as time-outs and "calls for help" • Describes patient safety concepts • Employs processes (e.g., checklists), personnel, and technologies that optimize patient safety • Uses system resources appropriately to improve both patient care and medical knowledge • Participates in an institutional process improvement plan to optimize ED practice and patient safety
Suggested evaluation methods: DOPE, Mini-CEX, logbook, OSCE, shift evaluation and simulation, multisource feedback, and portfolio work products including a QI project	

22. Systems-based Management

The fellow participates in strategies to improve healthcare delivery and flow, and he/she is aware of and responds to the larger healthcare context and system.

F2	F1
• Recommends strategies by which patients' access to care can be improved • Coordinates system resources to optimize patient care in complicated medical situations • Participates in processes and logistics to improve patient flow and decrease turnaround times (e.g., rapid triage, bedside registration, fast tracking, bedside testing, rapid treatment units, standard protocols, and observation units) • Creates a departmental flow metric from benchmarks, best practices, and dashboards • Develops internal and external departmental solutions to process and operational problems • Addresses the differing customer needs of patients, hospital medical staff, EMS, and the community	• Has knowledge of members of the ED team (e.g., nurses, technicians, or security staff) • Mobilizes the institution's resources to assist in patient care • Participates in patient satisfaction initiatives • Practices cost- effective care • Demonstrates the ability to call on other resources in the system to provide optimal healthcare
Suggested evaluation methods: DOPE, Mini-CEX, logbook, OSCE, shift evaluation and simulation, and multisource feedback	

23. Technology

The fellow uses technology to accomplish and document safe healthcare delivery.

F2	F1
• Uses decision support systems in electronic health records (as applicable to the institution) • Recognizes the risks of computer shortcuts and reliance upon computer information in accurate patient care and documentation • Recommends system redesigns for improved computerized processes	• Uses the electronic health records to order tests, medications, and document notes and respond to alerts • Reviews medications of patients • Ensures that medical records are complete, with attention paid to preventing confusion and error • Uses technology for patient care, medical communication, and learning effectively and ethically
Suggested evaluation methods: DOPE, Mini-CEX, logbook, OSCE, shift evaluation, simulation, and multisource feedback	

2.5 Procedures and skills integral to the practice of pediatric emergency medicine

The fellow performs procedures that are indicated for all appropriate patients (including those who are uncooperative, those of all pediatric age groups, those who are hemodynamically unstable, or those who have multiple comorbidities, poorly defined anatomy, a high risk of pain or procedural complications, or require sedation), takes steps to avoid potential complications, and recognizes the outcome and/or complications resulting from the procedure.

2.5.1 What is expected from F1:

- Identification of the pertinent anatomy and physiology for a specific procedure
- Appropriate use of universal precautions
- Performance of patient assessment, obtaining informed consent, and ensuring monitoring equipment is in place in accordance with patient safety standards
- Knowledge of the indications, contraindications, anatomic landmarks, equipment, anesthetic and procedural techniques, and potential complications for common ED procedures
- Performance of the indicated common procedures, with moderate urgency, for a patient who has identifiable landmarks and low to moderate risk of complications
- Performance of post-procedural assessment and identification of potential complications

2.5.2 What is expected from F2:

- Determination of the backup strategies in case the initial attempts to perform a procedure are unsuccessful
- Correct interpretation of the results of diagnostic procedures
- Performance of procedures indicated for patients with challenging features (e.g., poorly identifiable landmarks, extreme age, or comorbidities)
- Performance of the procedures indicated, taking steps to avoid potential complications, and recognition of the outcomes and/or complications resulting from the procedure
- Teaching procedural competency and correcting mistakes

The following table contains procedures and skills that trainees are required to learn

Procedures	F1	F2	
	*	*	Performs basic airway maneuvers or adjuncts (jaw thrust/chin lift/oral airway/nasopharyngeal airway)	Airway
	*	*	Ventilates/oxygenates the patient using BVM	
	*	*	Intubation: *direct laryngoscopy, insertion of oral endotracheal tubes, and use of the rapid sequence induction technique*	
	*	*	Insertion of the LMA	
	*	*	Use of an additional difficult airway device (e.g., stylet, bougie, or intubating LMA)	
	*	*	Video laryngoscopy and associated devices (e.g., optical stylet or flexible fiber optic laryngoscope)	
	*	*	Securing and caring for endotracheal tubes, including during transport	
	*		Surgical/needle cricothyrotomy Δ	
	*		Percutaneous transtracheal ventilation Δ	
	*		Percutaneous tracheostomy Δ	
	*	*	Replacing tracheostomy tube	
	*	*	Selection of the appropriate mode and parameters for mechanical ventilation	
	*	*	Noninvasive ventilatory management	
	*	*	Ventilatory monitoring	

			Breathing
*	*	Decompression thoracostomy	
*	*	Pneumothorax/hemothorax detection	
*	*	Chest tube placement and post-tube care	
*	*	Spirometry and peak flow measurement	
			Circulating
		Vascular access	
*	*	*Scalp vein*	
*	*	*Peripheral vein*	
*	*	*Intraosseous*	
*	*	*External jugular vein*	
*		*Central venous catheter without ultrasound guidance*	
*	*	*Umbilical vein*	
*		*Internal jugular vein*	
*		*Subclavian vein*	
*		*Femoral vein*	
*		*Central venous catheter with ultrasound guidance*	
*		*Arterial catheterization*	
*	*	External chest compression	
*	*	ECG interpretation	
*		External cardiac pacing∆	
*		Pericardiocentesis∆	
*	*	Cardioversion	**Anesthesia and Acute Pain Management**
*	*	Defibrillation	
*		Focused sonographic assessment of circulatory status (FAST, RUSH, EFAST)	
*	*	Topical anesthesia	
*	*	Local anesthesia	
*		Hematoma blocks	
*		Intra-articular blocks	
*	*	Procedural sedation and analgesia	

		Nerve block anesthesia:	
*	*	*Digital*	
*	*	*Supraorbital*	
*	*	*Infraorbital*	
*		*Mental*	
*		*Mandibular*	
*		*Lingual*	
*		*Median*	
*		*Radial*	
*		*Ulnar*	
*		*Intercostal*Δ	
*		*Femoral*Δ	
*	*	*Penile*	

Diagnostic and Therapeutic Procedures:

			Abdominal and Gastrointestinal
*	*	Nasogastric/orogastric tube insertion	
*		Abdominal paracentesisΔ	
*	*	Gastrostomy tube replacement	
*	*	Abdominal hernia reduction	
*		Diagnostic Peritoneal Lavage 4	
*	*	Fecal disimpaction	
			Cutaneous
*	*	Application of bandages/dressings	
*	*	Suturing: single- and multiple-layer closure	
*	*	Closure with staples	**Head, Ear, Eye, Nose, and Throat**
*	*	Closure with tissue adhesive glue	
*		Wound hematoma evacuation	
*	*	Incision and drainage of abscess	
*	*	Basic wound debridement	
*	*	Wound closure techniques	
*	*	Nail trephination	

*	*	Nail-bed laceration repair	
*	*	Debridement of burn blisters/frostbite Δ	
*		Escharotomy Δ	
Control of epistaxis			
*	*	*Anterior intranasal packing*	
*		*Posterior intranasal packing*	
*		*Nasal cautery*	
*	*	Pupil dilatation	
*	*	Ocular irrigation	
*	*	Ocular patching	
*	*	Tonometry	
*	*	Slit-lamp examination	
*		Drainage of auricular hematoma	
*	*	Insertion of the external auditory canal wick$	
*	*	Tooth stabilization	
Systemic Infection			
*	*	Personal protection (equipment and techniques)	
*	*	Universal precautions and exposure management	
			Musculoskeletal
*		Arthrocentesis of the knee	
*	*	Application and removal of the cervical collar/spinal immobilization	
*	*	Immobilization of unstable pelvic fractures	
*	*	Application and removal of femoral traction devices	
*	*	Rigid splint immobilization of extremity fractures	
*	*	Circumferential cast immobilization of extremity fractures	
*	*	Application of walking casts	
*	*	Fracture/dislocation immobilization techniques	
*	*	Application of upper-extremity slings	

*	*	Stabilization and immobilization of uncomplicated upper- and lower-extremity fractures	
*	*	Temporary reduction and immobilization of displaced fracture for the relief of pain and/or neurovascular compromise	
Definitive reduction and immobilization of the following displaced fractures when appropriate:			
*	*	*1-Distal radius*	
*	*	*2-Fifth metacarpal neck*	
*	*	*3-Phalanx*	
Reduction of subluxations and dislocations including the following:			
*		*Glenohumeral joint*	
*	*	*Radial head subluxation*	
*	*	*Metacarpophalangeal joint*	
*	*	*Interphalangeal joint*	
*		*Temporomandibular joint*	
*		*Sternoclavicular joint*	
*	*	*Elbow*	
*	*	*Hip*	
*	*	*Knee*	
*	*	*Patella*	
*	*	*Ankle*	
Splinting of tendon and ligament injuries of the hand, including the following:			
*	*	*Volar plate injury*	
*	*	*Mallet finger injury*	
*	*	*Swan neck deformity*	
*	*	*Boutonnière deformity*	
*	*	Removal of a motorcycle helmet in a traumatized patient	
*	*	Management of fingertip amputation	
*	*	Compartment pressure measurement	
*	*	Lumbar puncture and measurement of CSF pressure	Nervous System
*	*	VPS tapping	

*	*	Removal of vaginal FBs	Gynecology
*		Sexual assault examination$	
			Psychobehavioral
*	*	Violent patient management/restraint	
			Renal and Urogenital
*	*	Urethral bladder catheterization	
*		Suprapubic bladder catheterization$	
*	*	Bladder irrigation$	
*		Testicular detorsion	
*		Reduction of paraphimosis	
*	*	Management of acute priapism	
*		Emergency cystourethrography$	
*	*	Gastric lavage	Toxicological
*	*	Activated charcoal	
			Other Diagnostic and Therapeutic Procedures
Removal of FBs			
*	*	*Laryngoscopy and removal of upper airway FBs*	
*	*	*Removal of FBs in the skin/subcutaneous tissues*	
*	*	*Removal of corneal or conjunctival FBs*	
*		*Removal of corneal rust ring*	
*	*	*Removal of FBs from the ear*	
*	*	*Removal of cerumen*	
*	*	*Removal of nasal FBs*	
*	*	*Removal of rectal FBs*	
			Ultrasound §
*	*	*Performs an EFAST scan*	
*		*Performs goal-directed focused ultrasound examinations*	
*		*Correctly interprets acquired images*	
*		*Facilitation of vascular access*	
*		*Presence of intraperitoneal free fluid*	
*		*Measurement of the diameter of the abdominal aorta*	

*	*Presence of pericardial fluid*	
*	*Presence of cardiac motion*	
*	Focused biliary ultrasound	
*	Detection of deep venous thrombosis	
*	Focused ultrasound of soft tissue and musculoskeletal structures	
*	*Ocular ultrasound*	
*	Focused emergency echocardiography	

▵ Rare but must demonstrate the ability and knowledge required
$ It is preferred if the fellow is able to perform this
§ See POCUS Rotation for more details of emergency medicine ultrasound curriculum

3. LEARNING OPPORTUNITIES

3.1 General Principles

1. Teaching and learning will be structured and follow a fixed protocol, with more responsibility for self-directed learning.
2. During emergency shifts, DOPE, Mini-CEX, mini-journal club, and mini-oral cases can be discussed with the consultant in the shift.
3. The fellow should improve and refine his/her skills in teaching by giving teaching sessions in shifts and have discussions with residents, interns, and students in different ways (oral cases, MCQs, slides, and radiographs).
4. Every week, at least **4–6 hours of formal training time** should be reserved.
5. The time and venue are planned with the center's PD. Formal teaching time excludes bedside teaching and clinic postings.
6. At least 4 hours per week should be allocated to the core education program (CEP).

The CEP will be supplemented by other practice-based learning such as:

a) Morbidity and mortality reviews
b) Journal clubs
c) Systematic reviews
d) Grand rounds
e) Problem-based learning
f) Simulation, mock code, or workshops

7. Every 4 weeks, at least 1 hour should be assigned to activities such as meeting with mentors (or the PD), reviewing the portfolio, or mini-CEX.

3.2 Formal Teaching Sessions

The fellow's weekly activities consist of a full day (8:00–15:00) throughout the year with a break period during the *Eid* holidays. Educational sessions will be tailored to the needs of specific training levels, with a specific theme each week. The sessions cover the entire clinical curriculum of the PEM Fellowship over 2 years. The chief fellow will create the schedule that will be reviewed by the PDs before the final agreement. Academic activities are designed to encourage interactive adult learning and self-learning skills. Attendance is mandatory for all fellows (minimum 75%), and sessions consist of the following:

3.2.1 Topic Presentation

- The fellow presents a common and important topic related to the theme of the week.

Objectives

1. The presentation should cover the pathophysiology, main signs, and symptoms.
2. The presentation should discuss the approach and initial management.

3.2.2 Case Presentation

- This is a discussion session moderated by a pediatric emergency consultant or PD of the center, with topics from the week's theme presented in a clinical scenario format.

Objectives
1. A real case that the presenting fellow was involved with.
2. Present a comprehensive history and physical examination findings with details pertinent to the patient's problem.
3. Formulate a list of all problems identified in the patient history and physical examination.
4. Develop a proper and informative differential diagnosis and allow the audience to interact.
5. Formulate and discuss the final diagnosis, treatment plan, and disposition.
6. Take home points: pearls and pitfalls about the case.

Improve case presentation skills through proper feedback on presentation.

3.2.3 Grand Rounds

- The grand rounds involve discussions regarding topics that affect PEM practice from the fellow's perspective within the theme of the week. For more benefit, a pediatric emergency consultant or specialized guest speaker in the field should lead this session.
- The grand rounds should include the following: trauma, transportation, radiology, or toxicology.

Objectives
1. Increase the physician's medical knowledge and skills, ultimately improving patient care.
2. Understand and apply current practice guidelines in the field of PEM.
3. Describe the latest advances in the field of PEM and research.
4. Identify and explain areas of controversy in the field of PEM.

3.2.4 Core Review

- A concentrated review of highly diverse topic information of slides or MCQs.

3.2.5 Morbidity and Mortality Reviews

- Consists of a patient case presentation and several brief didactic discussions by faculty that address questions regarding pathology, epidemiology, diagnostic approach, and management guidelines regarding the case.

Objectives
a) Identify areas of improvement for clinicians involved
b) Prevent future errors that lead to morbidity or mortality
c) Modify physician's behavior and judgment based on previous experiences
d) Identify the need for updated policies and guidelines that may affect patient care

3.2.6 Journal Club

- In this once-monthly activity, the fellows present and critically appraise the latest articles published in PEM journals.

Objectives
1. Critically appraise the literature
2. Promote continuing professional development
3. Understand the basis of hypothesis testing (type I and II errors, p values, 95% confidence intervals, and sample size)
4. Keep up with the literature
5. Ensure that professional practice is evidence-based
6. Learn and practice critical appraisal skills
7. Understand the sources of bias
8. Understand how results of studies can be used in clinical practice
9. Understand the basis of diagnostic testing (prevalence, sensitivity, specificity, positive and negative predictive values, and likelihood ratios)

3.2.7 Problem-based Learning

- This is a learning method that uses the problems as a starting point or stimulus for a question or assimilation of new knowledge

Objectives
1. Know how to identify and analyze the problem
2. Identify relevant facts and generate hypotheses
3. Develop self-directed learning skills and teamwork
4. Improve searching skills and article appraisal

3.2.8Simulation

- Modern day methodology for training healthcare professionals by using advanced educational technology. Medical simulation is the experiential learning every healthcare professional will need, but cannot always engage in during real-life patient care.

Objectives
1. Deliberate practice in a safe, clinical environment without fear of patient injury
2. A multidisciplinary activity reflecting the usual team members who participate at the fellow's facility

Description

Emergency medicine, by nature, is filled with critical, high-frequency procedures and patient presentations. In our PEM Fellowship Program, we supplement the fellows' robust clinical experience with a high-fidelity simulation curriculum to ensure that learners are comfortable with the full-spectrum of our specialty. The curriculum uses a combination of high-fidelity mannequins with touch-screen technology, task trainers for procedures, standardized patients, and actors that play the part of nurses and family members. We concentrate our efforts on making the experience as realistic and high-yield as possible.

In the fourth week of each month, fellows attend a half-day session (8:00–13:00) that comprises a combination of clinical cases and procedures. Multiple faculty members attend as well, giving real-time teaching and feedback. The time during the simulation session is protected, and all fellows attend, even if they are not on duty.

The PEM fellow will take part in pediatric resuscitation simulation scenarios as a team leader and a team member. The scenarios are based on real cases, and they encompass pediatric emergency conditions that require early recognition and prompt management. High-fidelity simulators and task trainers at the Simulation Center (distributed among four centers in Riyadh) will be used in this simulation session; resuscitation tasks are carried out in real time. The scenarios are designed to highlight unique pediatric anatomical and physiological idiosyncrasies.

The topics cover the pediatric airway, upper and lower respiratory collapse, shock, trauma, CNS emergencies, congenital heart disease, metabolic emergencies, cardiopulmonary failure and arrest, neonatal sepsis, maltreatment, and toxicological emergencies.

The simulation session will also provide the PEM fellows with the opportunity to demonstrate psychomotor skills and procedures used in pediatric emergency resuscitation including advanced airway control; surgical airway, peripheral, and central vascular access; intraosseous cannulation; thoracocenthesis, and lumbar puncture. The fellow will also practice reviewing ancillary tests, including radiographic imaging, ECG, and blood tests relevant to the scenarios.

The session is entirely interactive and simulation-based with no didactic components, allowing for optimal hands-on role-play and team building. The aim is to enhance teamwork and communication skills in resuscitation settings. The post-scenario debriefing allows the fellows to reflect on their performance in a relaxed and non-threatening environment where the performed tasks are reviewed, and potential improvements are discussed within the group.

Suggested Topics covered in the simulation

Simulation	
F2	F1
1- Respiratory: ❖ Trauma with difficult airway ❖ Upper airway obstruction	1- Respiratory: ❖ Aspiration pneumonia with tube obstruction ❖ Upper airway obstruction (croup) ❖ Acute chest crisis (acute chest syndrome)
2- Endocrine: ❖ Adrenal crises ❖ Thyroid storm	2- Endocrine: ❖ Diabetic ketoacidosis
3- Toxicology: ❖ Ecstasy ingestion ❖ Organophosphate ❖ Clonidine	3- Toxicology: ❖ Tricyclic antidepressant (TCA) ❖ Organophosphate ❖ Paracetamol/iron or aspirin ingestion

4- Trauma: ❖ Multiple trauma ❖ Pediatric neurogenic shock	4- Trauma: ❖ Multiple trauma ❖ Abdominal trauma ❖ Severe head injury
5- Environmental Emergencies: ❖ Burns: smoke inhalation, burns, and CO and cyanide poisoning ❖ Head injury ❖ Electrical injuries: ventricular tachycardia, hyperkalemia, myoglobin urea	5- Environmental Emergencies: ❖ Drowning ❖ Heat stroke
6- Neurological Emergencies: ❖ Encephalitis ❖ Hydrocephalus with ventriculoperitoneal shunt (VPS) along with high intracranial pressure	6- Neurological Emergencies: ❖ Status epilepticus ❖ Encephalitis
7- Oncology: ❖ Mediastinal mass ❖ Breaking bad news	7- Oncology: ❖ Tumor lysis syndrome ❖ Febrile neutropenia
8- Child abuse	8- Surgical abdomen (necrotizing enterocolitis)
9- Opioid overdose due to medication error and how to discuss the adverse events	9- Cyanotic congenital heart disease

Suggested Workshops

Workshops	
F2	F1
Disaster and Emergency Medical Systems	Procedure Sedation and Analgesia
POCUS	Orthopedic and Casting
Phone Call	Wound Suture and Dressing
Communication Skills	Airway Workshop Triage System
Airway	Triage System
Leadership	Households
Debriefing	Child Abuse
Handover	Ophthalmology and Ear-Nose-Throat

3.3 Pediatric Emergency Core Specialty Topics[11]

1 - Cardiorespiratory arrest

- Define the causes of cardiac arrest in children, while recognizing that respiratory and circulatory failure are the most common precipitants but also include drowning, electrocution, and hypothermia - Describe the prognostic factors influencing the outcome of cardiac arrest in children - Know the PALS/BLS/NRP guidelines - Describe the pharmacology, indications and contraindications, dose calculation, and routes of administration of drugs used in resuscitation and stabilization of children in cardiac arrest - Recognize when to cease resuscitation - Manage sudden death in infancy and apply the local management guidelines for supporting the family - Demonstrate the ability to apply the principles of evidence-based medicine	Objectives
- Establish and maintain a patent airway using basic airway maneuvers and adjuncts and ventilate using BVM - Be able to intubate - Lead a resuscitation team - Be familiar with the main component of effective resuscitation and ensuring good team dynamics and professionalism - Obtain peripheral venous, arterial, and intraosseous access - Initiate rewarming techniques in hypothermic patients - Participate with the pediatrician regarding the management of sudden death in infancy through investigations, procedures, and care of the parents - Lead and coordinate a pediatric cardiac arrest (resuscitation) - Obtain follow-up results of positive tests or radiology reports and discuss them with the patient and their family - Master the appropriate use of consultations and have knowledge about the patients' disposition, education, and follow-up - Maintain appropriate documentation and disposition plans and ensure that junior trainees do so as well - Deliver bad news effectively with compassion and sensitivity	Skills

2 - Major trauma in children

- Demonstrate the ability to rapidly and thoroughly assess patients with major and minor trauma by using the ATLS approach **- Recognize immediate life-threatening injuries and establish priorities for the initial management of patients with life-threatening trauma** **- Recognize the importance of the mechanism of injury in the evaluation and treatment of trauma patients** **- Demonstrate an understanding of the utilization and limitations of appropriate resources** ***Head injury*** **- Define the pathophysiology and clinical signs of severe head injury and when neurosurgical involvement is needed** **- Implement the updated guidelines** ***Facial injury*** **- Ability to assess and treat facial trauma** **- Differentiate between facial fractures and discuss their diagnosis and treatment: LeFort I, II, and III fractures, as well as zygomatic, mandibular, nose, orbital, and tripod fractures** ***Neck injury*** **- Demonstrate the ability to evaluate and manage blunt neck injuries** **- Define the anatomy of the neck, have knowledge about the classification of penetrating trauma by zone, and be aware of the diagnostic and therapeutic interventions required for each region** ***Chest injury*** **- Define the chest injuries through the different age groups, including pulmonary contusion and flail chest** **- Demonstrate the ability to assess blunt chest trauma and develop treatment priorities in stable and unstable patients** ***Abdominal injury*** **- Differentiate between the common types of injury, their association with the mechanism of injury, and their clinical detection and investigation** **- Demonstrate the ability to assess the abdomen of blunt trauma patients, including indications for immediate laparotomy**	**Objectives**

Spinal injury - Describe the mechanisms and risk of spinal injury in children - Be aware of SCIWORA - Define the pathophysiology and signs of neurogenic shock ***Burns*** - Demonstrate the ability to calculate the percentage of burn surface area for children and determine fluid requirements - Recognize the depth of burns and the specific area, such as the face, that needs specialist referral - Recognize burns as the presentation of possible non-accidental injuries (NAI) - Diagnose and treat smoke inhalation ***Pelvic fractures*** - Describe common fracture patterns ***Physical abuse*** - Recognize signs of physical abuse and how to proceed with local protocols for safeguarding children	
- Recognize the patients who need intubation and demonstrate the ability to manage the airway of pediatric and/or adult patients with trauma - Assess the level of consciousness in a child by using AVPU and GCS - Lead and coordinate pediatric trauma resuscitation - Communicate effectively with members of the trauma team - Manage the anxious immobilized child - Use spine immobilization techniques in trauma patients - Examine the spine and apply indications for "clearing" the spine - Demonstrate the appropriate use of analgesics and sedatives in trauma patients - Demonstrate the appropriate use of antibiotics in trauma patients - Request appropriate imaging as per national guidelines in different situations - Interpret plain radiographs of the chest, cervical, thoracic and lumbar spine, pelvis, and extremities in trauma patients - Recognize possible patterns of NAI in burn injury and make the appropriate referrals - Recognize non-responders to fluid therapy and the need for urgent surgery or vasopressors - Establish treatment priorities in patients with complex issues under stressful conditions and understand the crash protocol - Be familiar with different airway interventions and know the advantages, disadvantages, and complications of each method	**Skills**

- Be familiar with different airway interventions and know the advantages, disadvantages, and complications of each method - Demonstrate the ability to conduct and interpret FAST and EFAST - Effectively and sensitively communicate with seriously injured patients and their families - Arrange appropriate consultation and disposition of trauma patients and coordinate with multiple consultants involved in the care of trauma patients - Deliver bad news effectively with compassion and sensitivity - Perform the following procedures: • oral intubation considering the indications and contraindications, as well as alternative airway management • venous cut down, insertion of large-bore peripheral and central venous lines and/or trauma lines as well as arterial lines • needle and tube thoracostomy (indications and timing) • local wound exploration, peritoneal lavage, and vessel ligation • NGT, OGT, and urethral catheter insertion as well as the indications and contraindications in trauma patients • repair of simple and complex lacerations, splinting of extremity fractures, and reduction and immobilization of joint dislocations, as well as pelvic fracture stabilization • cricothyroidotomy, resuscitative thoracotomy, pericardiotomy, and extensor tendon repair (as feasible/simulation) • methods of rewarming • Burr-hole (simulation)	

3 - Children with shock

- Rapid recognition of the acutely ill child in shock, formulating a differential diagnosis - Describe the pathophysiology, classification, and management pathway based on PALS - Become an expert in obtaining a diagnosis	Objectives
- Recognize and initiate treatment of sepsis as per hospital guidelines	Skills

4 - Unconscious children

- Rapid recognition of the acutely ill child **- Practice triage skills and prioritize care of children in the ED** ***Seizures*** **- Describe the differential diagnosis of seizures, including febrile convulsions and status epilepticus in children** ***Hypoglycemia*** **- Define the causes, presentations, complications, investigations, and emergency treatment in the neonatal period and after.** **Recognize and manage inborn error as a cause of hypoglycemia and its initial investigation in the ED** ***Diabetic ketoacidosis*** **- Understand local and national guidelines for the management of diabetic ketoacidosis, including the principles of fluid management and insulin therapies** **- Become an expert in dealing with children with deteriorate level of consciousness.**	**Objectives**
- Recognize and treat life-threatening complications **- Manage acutely ill patients by using all emergency procedures, including Rapid Sequence Intubation, IO, and resuscitation team management** ***Seizures*** **- Initiate appropriate management for status epilepticus** ***Hypoglycemia*** **- Demonstrate the ability to reverse hypoglycemia** ***Diabetic ketoacidosis*** **- Formulate a likely diagnosis and recognize features of the presentation and complications** **- Recognize the features of cerebral edema and high ICP; and be able to provide emergency treatment** **- Perform appropriate investigations and act on the results** **- Prescribe fluid, electrolyte, and insulin therapy according to local guidelines**	**Skills**

5 - Anaphylaxis

Understand the presentation and management of anaphylaxis in children	Objectives
- Initiate the appropriate management for anaphylaxis (PALS guidelines) - Know when to ask for help	Skills

6 - Apnea, stridor, and airway obstruction:

- Differentiate between the infectious, allergic, and obstructive causes of airway obstruction in children, including epiglottitis and post-tonsillectomy bleeding - Describe the indications and contraindications for a surgical airway - Define the age-appropriate algorithms for obstructed airway, including choking - Assess, establish, and maintain a patent airway in a child	Objectives
- Recognize signs of airway obstruction - Perform basic and advanced life support maneuvers for the choking child - Call for senior help when required	Skills

7- Pediatric Acute Presentations (PAPs)

PAP 1 - Abdominal pain

- Recognize the causes of abdominal pain in all age groups - Quickly recognize life-threating and urgent cases ***Scrotal pain*** - Describe differential diagnosis, investigate, and manage those requiring surgical referral ***Recurrent abdominal pain*** - Define contributing factors - Ensure appropriate follow-up ***Constipation*** - Identify contributing factors, initiate treatment, and ensure follow-up	Objectives
- Examine and recognize the cause of acute abdominal pain - Utilize appropriate patient history and examination results to determine the need for imaging and investigation	Skills

PAP 2 - Accidental poisoning, and self-harm

- Recognize the likely intoxicated child or adolescent - Identify the major types of ingestion by age - Develop competence in the management of patients with ingestion of unknown poisons, specific ingestion, multiple ingestions, and substance abuse, as well as accidental versus intentional poisoning - Identify the specific signs and symptoms of poisoning with a range of toxic agents - Be able to implement appropriate investigations - Prescribe the appropriate antidotes and identify specific therapies available for various ingested substances - Differentiate between the various forms of decontamination and their indications, including activated charcoal, whole bowel irrigation, gastric emptying, and other extraordinary measures - Evaluate and treat patients with a chemical injury and know the treatment for hydrochloric and sulfuric acid burns, hydrofluoric acid and alkali burns, and white phosphorus burns - List the differences between alkali and acid burns - State the common injuries/conditions associated with electrical injuries and list the potential complications - Be able to access poison information - Identify the pharmacology and treatment of common poisonings - Be aware of OD as an expression of self-harm - Manage adolescents refusing treatment for a life-threatening overdose - Manage the most common ingestions, including but not limited to acetaminophen, aspirin, tricyclic antidepressants, toxic alcohols, organophosphates, anticonvulsants, batteries, hydrocarbons, corrosives, lithium, digoxin, calcium channel blockers, antidiabetic medications, iron, and sympathomimetics	Objectives
- Recognize the need for continued ED observation compared to hospitalization or ICU care - Recognize self-harm in children and adolescents - Recognize self-harm as an indicator of serious emotional distress - Refer to the Child and Adolescent Mental Health Service team - Identify medico-legal risks and take steps to address them - Learn the need for various methods of termination of toxic exposure, hastening the elimination of poison, and protecting one's self and other team members from being intoxicated	Skills

PAP 3 – Brief, resolved, unexplained event (BRUE)

- Know when an infant may be seriously ill or exhibits apnea, cyanosis change in muscle tone, choking, or gagging - Know the common causes • Central apnea • Obstructive apnea • Gastroesophageal reflux • Arrhythmias and myocarditis • Breath-holding spells • Near sudden infant death syndrome (SID) • Toxins	Objectives
- Obtain complete patient history, perform physical examination, and initiate appropriate tests - Arrange admission as indicated	Skills

PAP 4 - Blood disorders

Sickle cell anemia - Identify the common presentations and complications of sickle cell crises - Provide emergency management as well as appropriate pain control and fluid balance - Differentiate between the presentation and causes of anemia and ensure appropriate referral ***Purpura and bruising*** - Identify the causes of purpura - Recognize features in the presentation that suggest serious pathology, including meningococcemia and leukemia ***Leukemia/lymphoma*** - Define different presentations - Recognize oncology emergencies and how to manage them	Objectives
Sickle cell anemia - Prescribe fluids and analgesia safely ***Purpura and bruising*** - Manage life-threatening causes of purpura - Diagnose, organize follow-up, and explain Henoch–Schönlein purpura and idiopathic thrombocytopenia - Recognize patterns suggestive of NAI and organize care ***Leukemia/lymphoma*** - Recognize and ensure referral	Skills

PAP 5 - Breathing difficulties - recognize the critically ill and those who will need intubation and ventilation

- Rapidly recognize the acutely ill child - Practice triage skills and prioritize care of children in the ED - Rapidly obtain patient history and perform physical examination for critically ill children - Lead the pediatric resuscitation and critical care team - Identify the etiologies, diagnosis, and treatment of common respiratory distress, cardiac emergencies, and dysrhythmia - Demonstrate an understanding of appropriate resource utilization and limitations - Understand "do-not-resuscitate" orders, advance directives, living wills, competency, power of attorney, and brain death criteria and be aware of hospital policies ***Asthma in children*** - Apply the Asthma guidelines for the management of asthma - Describe the indications, contraindications, and pharmacology of the available therapies - Describe the indications for intubation in severe asthma and the drugs used ***Bronchiolitis*** - Define the principles of management ***Pneumonia in children*** - Identify the principles of management of community-acquired pneumonia ***Pertussis*** - Identify the age-dependent presentations and indications for admission - Initiate the appropriate treatment for patients and contacts ***Cardiac causes*** -Recognize heart failure and dysrhythmias (PALS)	Objectives
- Recognize life-threatening asthma and identify who may need intubation and ventilation - Manage patients on a ventilator, including ventilator types, and demonstrate the appropriate use of ventilation techniques - Describe indications of continuous positive airway pressure (CPAP) and bi-level positive airway pressure modes - Be able to order appropriate fluid, blood, and imaging tests (resource utilization) - Be familiar with dosages, indications, and contraindications of pharmacologic interventions	Skills

- Select appropriate antibiotics for pediatric patients with severe infection **- Assess children for the presence of severe illness and the appropriateness of pediatric ICU admission and subspecialty involvement** **- Understand the multidisciplinary team in the management of the critically ill patient, including the roles of nursing staff, respiratory therapists, and consulting staff** **Specific Skills:** • **Endotracheal intubation, using different modalities** • **Cricothyroidotomy** • **Adjunct airway management, including laryngeal mask airway (LMA) and bag-valve-mask (BVM)** • **Ventilator management: invasive/noninvasive** • **Thoracentesis** • **Tube thoracostomy** • **Peripheral and central intravenous insertion** • **Arterial line insertion** • **Intraosseous infusions**	

PAP 6 - Concerning presentations

Physical abuse **- Recognize the signs of physical abuse** **- Recognize the signs of common injury or illness that may mimic physical abuse** **- Be aware of the common fractures observed in victims of physical abuse** ***Sexual abuse*** **- Identify the ways in which children might reveal sexual abuse** **- Understand and recognize the signs and symptoms of sexual abuse** **- Understand the importance of seeking help from experienced colleagues in the assessment of children where NAI might be an issue** ***Neglect*** **- Define the ways in which children may present with neglect**	**Objectives**
- Be aware of legal, ethical, and professional obligations and the policy of the institute to protect children from suspicious circumstances ***- Report all details concerning the case and event***	**Skills**

Physical abuse - Recognize patterns of injury or illness that might suggest NAI - Be able to initiate procedures regarding safeguarding children as per local policy ***Sexual abuse*** - Be able to initiate appropriate procedures regarding safeguarding children if sexual abuse is suspected ***Neglect*** - Be able to refer the child to the appropriate authorities	

PAP 7 - Dehydration secondary to diarrhea and vomiting

- Identify the etiology, pathophysiology, and presentation of dehydration - Recognize the life-threatening causes and complications of dehydration ***Pyloric stenosis*** - Be aware of the presentation, investigation, and treatment of life-threatening electrolyte disturbances	Objectives
- Be able to calculate and prescribe fluid replacement and maintenance fluids and replacement for ongoing losses according to patient`s hydration status.	Skills

PAP 8 - Ear-nose-throat

Traumatic ear conditions in children Recognize the possibility of NAI in cases of ear trauma ***Earache or discharge in children*** Identify the presentation of otitis media and glue ear and their association with hearing loss in children ***Painful noses*** Identify FBs Identify fractured nose and septal hematoma	Objectives
Traumatic ear conditions in children - Be able to remove FBs from the ear canal or pinna - Recognize a hematoma and determine if it requires surgical drainage	Skills

Earache or discharge in children - Be able to perform otoscopy correctly - Be able to identify otitis externa and otitis media and treat them appropriately ***Others*** - Recognize that language delay or attention deficit requires further referral	

PAP 9 - Fever in all age groups

- Be able to obtain a comprehensive history and perform physical examination in feverish children - Be aware of the national guidelines for the management of fever in children - Identify possible causes of fever ***Urinary tract infections*** - Identify the presentation, etiology, and management of UTI in the acute setting for different age groups - Differentiate between the range and accuracy of the different methods of urine collection - Be able to interpret microbiological findings and initiate appropriate treatment - Define the need for and types of further investigation ***Meningitis/encephalitis*** - Differentiate between bacterial and viral etiologies for all age groups and the appropriate antimicrobial or antiviral treatment - Recognize and initiate treatment for life-threatening complications including raised intracranial pressure ***Kawasaki Disease*** - Understand and recognize the presentation, signs, and management of Kawasaki disease ***When no focus of infection is found*** - Define the implications for different age groups - Become an expert with presentations - Identify which children can be safely sent home	Objectives
- Appropriately prescribe antipyretics and antibiotics - Be able to collect blood cultures and perform SPA and LP - Identify when help is needed and to ask for it accordingly	Skills

PAP 10 - hypotonic child

- Differentiate the causes of presentation of a child with hypotonia	Objectives
- Recognize and treat this life-threatening condition	Skills

PAP 11 - Gastrointestinal bleeding

- Describe the causes of upper and lower gastrointestinal bleeding and recognize life-threatening causes including intussusception	Objectives
- Be able to stabilize the hemodynamically compromised patient, including the use of intraosseous and central access - Identify the need for investigations including endoscopy, as well as the need for blood transfusion and surgery	Skills

PAP 12 - Headache

Meningitis/encephalitis - Differentiate between bacterial and viral etiologies for all age groups and the appropriate antimicrobial or antiviral treatment ***Headaches*** - Identify the causes and differential diagnosis in children - Recognize serious causes	Objectives
- Recognize and initiate treatment for life-threatening complications, including raised intracranial pressure, as well as indications for initiating investigation, imaging, and effective management	Skills

PAP 13 - Neonatal presentations

Delivery* and resuscitation of the newborn - Have the knowledge and skills to assess and manage neonates presenting to the ED - Be able to formulate a differential diagnosis for a variety of common presenting symptoms - Be able to lead a resuscitation team as per the Neonatal Resuscitation Program (NRP) guidelines - Define the pathophysiological processes leading to neonatal cardiopulmonary instability, including the role of thermoregulation - Identify neonates requiring admission or midwife or health visitor input, as well as mothers requiring additional support - Recognize healthy neonates	Objectives

Neonatal sepsis - Describe symptoms and signs of sepsis in children, e.g., hypothermia and apnea - Define the importance of timely treatment and the range of treatments for likely pathogens ***Cyanotic/non-cyanotic congenital heart disease*** - Importance and relevance of duct-dependent heart disease ***Jaundice*** - Identify the causes and investigation of neonatal jaundice	
Resuscitation of the newborn - Possess resuscitation skills ***Neonatal sepsis*** - Undertake resuscitation and appropriate investigations ***Cyanotic/non-cyanotic congenital heart disease*** - Identify neonates requiring urgent specialist opinion ***Jaundice*** - Recognize jaundice and liaise with specialists	Skills

PAP 14 - Ophthalmology

- Recognize the difference between periorbital and orbital cellulitis	Objectives
- Be able to test for visual acuity - Be able to choose the need for investigation and imaging as needed - Identify specific antibiotics needed and the appropriate route of administration - Understand the disposition and need for urgent referral or follow-up	Skills

PAP 15 - Pain in children

- Know how to assess pain in children - Describe the range of options to relieve pain, including non-pharmacological and pharmacological agents, routes of administration, and dosage - Know how to select the best option - Describe the safe doses, side effects, and toxicity of different agents	Objectives

- Know the principles of how to safely sedate children by using ketamine, including the use of sedation checklists and management of complications (such as laryngospasm), and provide discharge instructions - Become an expert in the use of all analgesics in children,	
- Be able to prescribe and safely deliver nasal diamorphine, intravenous opiates, local anesthetic blocks, oral analgesics, and nitrous oxide	Skills

PAP 16 - Painful limbs – non-traumatic

- Differentiate between rheumatologic, infectious, malignant, and non-accidental causes of musculoskeletal presentations ***Limping*** - Be able to examine the gait, posture, and hip joints of all age groups -Describe the differential diagnosis of limps ***Septic arthritis*** -Be able to diagnose septic arthritis in different age groups	Objectives
- Be able order the correct blood tests - Be able to order the correct imaging test - Recognize when to refer a patient to a specialist	Skills

PAP 17 - Painful injuries - traumatic

- Define the differences in pediatric and adult skeletal anatomy and indicate how those differences are manifested considering the clinical and radiographic presentations - Describe the anatomy, mechanism of injury, presentation, complications, management, and prognosis of common musculoskeletal and soft tissue injuries - Identify the likely types of soft tissue and bony injuries for each age group - Define wound pathophysiology, including cellular response, static and dynamic wound tensions, growth factors, and tensile strength - Evaluate and manage dental emergencies and disorders of the mandible, including fractures, dislocations, and infections - Describe the presentations, complications, diagnosis, and management of compartment syndrome - Differentiate between rheumatologic, infectious, malignant, and non-accidental causes of musculoskeletal presentations - Recognize and treat soft tissue infections involving the muscle, fascia, and tendons	Objectives

- Be able to judge if these injuries are appropriately associated with the stated mechanism of injury - Be able to examine a child in a way that localizes the injury - Describe the indications for emergency surgery in the treatment of fractures and dislocations - Define the Salter-Harris classification of epiphyseal injuries - Describe the likely time-frame for recovery in children - Be able to correctly order and interpret different modalities of radiographs in patients with orthopedic injuries - Describe the common fractures and injuries, specifically: • Hand injuries including nail-bed injuries (paronychia, felon, herpetic whitlow, septic arthritis, deep palmar space abscess, and cold injuries) • Boutonniere and Swan neck deformities • Distal radius and scaphoid fractures • Dislocated shoulder • Supracondylar fracture of the elbow and be able to identify those with neurovascular problems • Pulled elbow and be able to reduce this • Forearm fracture dislocations • Fractured femur and be able to perform femoral nerve block and splinting • Toddler's fracture • Compartment syndrome • Patellar dislocation • Amputation and preservation of tissue	
- Be able to prioritize and manage orthopedic injuries in multiple trauma patients - Define the pathophysiology of wound healing - Demonstrate an understanding of the predictors of wound sepsis - Be able to decide the type of pain management needed during a procedure - Be able to examine the joints, soft tissue, and tendons; check for neurovascular compromise; detect FBs; identify the sensory distribution of the ulnar, median, and radial nerves; and demonstrate the technique of two-point discrimination - Be familiar with the appropriate use of delayed closure techniques - Appropriately manage special wound types, including skin ulcers, human bites, animal bites, snake bites, plantar puncture wounds, dermal abrasions, and tar burns - Be able to perform the following procedures: • fracture/dislocation immobilization and reduction • open fracture management • arthrocentesis • splint, back-slab, and cast application • brace immobilization • effective wound cleaning	Skills

● effective wound cleaning ● various wound closure techniques (intradermal suture, facial closure, interrupted skin sutures, running skin sutures, vertical and horizontal mattress sutures, half-buried horizontal mattress sutures, tape closure, staples, and the use of glue), including indications and contraindications - Demonstrate the ability to perform a digital nerve block - Be familiar with the dosages, indications, contraindications, and side effects of standard analgesic and sedative agents used for acute orthopedic trauma -Be able to discuss informed consent and other relevant issues surrounding emergency room procedures - Recognize which fractures need an orthopedic opinion and those that cannot be treated in the ED - Identify the need for antibiotic and tetanus vaccination - Evaluate and preserve amputated limb parts - Evaluate and treat soft tissue injuries such as strains and crush injuries - Understand referral and disposition practices - Understand the principles of acute and chronic pain management for patients with musculoskeletal disorders - Provide clear preventive and discharge instructions	

PAP 18 - Rashes in children

Eczema and seborrheic dermatitis - Understand the common treatments for eczema and reasons for treatment failure ***Bites and infestations*** - Understand the etiology by age and the pathophysiology of bites and infestations - Understand and recognize the signs and symptoms of bites and infestations	Objectives
Eczema and seborrheic dermatitis - Manage eczema and seborrheic dermatitis - Advise patients and families regarding the disease etiology, course and treatment ***Bites and infestations*** - Manage children with acute bites and infestations, including the recognition of signs and symptoms of life- and limb-threatening complications	Skills

PAP 19 - Sore throat

Acute throat infections in children **- Recognize life-threatening airway obstruction in the epiglottitis and how to avoid it** **- Identify quinsy** **- Manage or refer for FBs in the throat**	**Objectives**
- Recognize the potentially life-threatening nature of post-tonsillectomy bleeding	**Skills**

Suggested Pediatric Emergency Academic Activity for F1 and F2			
Theme	**F2**	**F1**	**Theme**
Orientation	Welcome	Welcome	**Orientation**
	How to give a good talk	About the PEM Program in Saudi Arabia	
	Achieving the maximum examination score	Electronic resources in our training	
	Don't stop developing yourself	How to obtain benefit from your fellowship	
	How to present at a conference	How to give a good talk	
Resuscitation	Neonatal resuscitation	Neonatal resuscitation	**Resuscitation**
	Pediatric advanced life support	Pediatric advanced life support	
	AHA, Resuscitation Guideline update	AHA, Resuscitation Guideline update	
	Airway management	Airway management	
	Pharmacology in resuscitation	Pharmacology in resuscitation	
	Monitoring the sick patient	Monitoring the sick patient	
Trauma	Update in ATLS	ATLS – Approach	**Trauma**
	Head injury	Head injury	
	Neck injury	Neck injury	
	Reevaluating "pan scan" in pediatric trauma	Reevaluating "pan scan" in pediatric trauma	
	Chest trauma	Chest trauma	
	Abdominal/genitourinary trauma	Abdominal/genitourinary trauma	
	Common upper-extremity injuries	Common upper-extremity injuries	
	Common lower-extremity injuries	Common lower-extremity injuries	

Toxicological Emergency	Approach and management of patients with poisoning	Approach and management of patients with poisoning	**Toxicological Emergency**
	What are "toxidromes"?	What are "toxidromes"?	
	Household poisoning: a case-based discussion	Household poisoining: a case- based discussion	
	Acetaminophen toxicology	Acetaminophen toxicology	
	Beta-blockers and calcium channel blockers	Beta-blockers and calcium channel blockers	
	Aspirin toxicology	Aspirin toxicology	
	Iron toxicology	Iron toxicology	
	One pill can kill	One pill can kill	
	Antidepressants and TCA toxicology	Antidepressants and TCA toxicology	
	Drugs of abuse	Drugs of abuse	
	Organophosphates and carbamates	Organophosphates and carbamates	
	Alcohol toxicology	Alcohol toxicology	
	Toxicology round	Toxicology round	
Disaster/EMS	Pre-hospital care system	Facial trauma	**ENT Emergency**
	Disaster management team	Oral cavity and neck traumatic emergencies	
	What's the best tool for pediatrics disaster triage?	FB Aspiration	
	Saudi Arabia disaster preparedness	Ear and nose emergencies	
	HAZMAT team	ENT procedures workshop	
Environmental Emergency	Electrical injury	Necrotizing enterocolitis	**Surgical Emergency**
	Bioterrorism	Malrotation and midgut volvulus	
	Biomarkers for CO injury	Pyloric stenosis	
	Heatstroke	Appendicitis	
	Drowning		
	Smoke inhalation injury		
	Bites and stings		
	Burn		

Psychological and Social Emergency	Deaths in the emergency department	Intussusception	**Gastrointestinal Tract Emergency**
	Sudden infant death syndrome	Foreign body ingestion	
	Interpersonal violence	Gastrointestinal bleeding	
	Munchausen by proxy	Gastroenteritis (GE) and dehydration	
	Psychiatric emergency		
Behavioral Emergency	How to approach a suicidal patient	Testicular torsion	**Genital/ Gynecologic Emergency**
	What are the hospitalization criteria for anorexia and bulimia?	Male genitourinary problems	
	TEN-4	Female genitourinary and gynecological problems	
	Physical restraint indications and proper procedure		
	Acute agitation		
	TIPS in dealing with attention deficit hyperactivity disorder (ADHD) in the ED		
	TOP Skills you need in the ED to deal with a psychiatric child: • Assess the patient's mental state • Assess the potential risks to a patient's safety • Methods of physical restraint • Evaluate the need for medical clearance		
Physician-Patient Interaction	Dealing with angry patients	Arrhythmia in children	**Cardiovascular Emergency**
	Obtaining consent	Inflammatory and infectious heart disease	
	Disclosure of adverse events	Management of congestive heart failure	
	Breaking bad news	Hypertension	
	DAMA/LAMA	Cardiogenic shock	

Administration	Complaints in the ER	Acute renal failure and rhabdomyolysis	**Nephrology Emergency**
I	Patient flow	Hyperkalemia management	
	Designing a new ED	Nephrotic syndrome in the ED	
	Patient safety	Dialysis emergency	
	Reducing medication errors in the ER	Fluid and electrolyte disorders	
	Overcrowding		
Miscellaneous	Transportation Grand Round	Febrile infant less than 3 months old	**Infectious Diseases**
	Writing a quality project proposal	Soft tissue infection	
	Audiovisual session	Urinary tract infections	
	Practice examination	PEM approach to tuberculosis and brucellosis	
	Jeopardy 1	Septic arthritis in the ED	
	Oral cases		
	Challenging cases		
Neurological Emergency	Intracranial pressure management	Ataxia and weakness	**Neurological Emergency**
	Mannitol vs. 3% normal saline	"Syncope": how to approach it in the pediatric ED?	
	A child with implantable devices	A child with headache: Is it serious?	
	Migraine	Stroke management in the pediatric ED	
	Concussion	Hydrocephalus and VPS problems in the ED	
		Epileptic emergencies	
Devices in the ED	Airway devices and how to select them	Sickle cell disease management in the ED	**Hematology/ Oncology**
	Cardiac devices and troubleshooting	Blood transfusion	
	Pitfalls in gastrointestinal tract devices	Oncology emergency "case-based discussion"	
Anesthesia	Pain management in the ED	Pitfalls in anaphylaxis	**Allergy/ Immunology**
	PSA:: Group discussion	Approach to immune-deficient patients	
	Local and regional anesthesia	Food and drug allergy	

Radiology	Approach to pediatric radiology	Adrenal crises	**Endocrine Emergency**
	Seriously missed radiological findings	Diabetic ketoacidosis	
	Ordering radiologic examination	Thyroid emergency	
	The role of POCUS and ultrasound in EM		
Airway	Noninvasive modality of airway management	Management of asthma status	**Respiratory Emergency**
	Mechanical ventilation	Pneumonia	
	Post-intubation care	Stridor	
	Pediatric ICU joint round	Chronic pulmonary disease	
	Challenging cases in airway management	Bronchiolitis update	
Child Abuse	Adolescent emergency	Physical abuse and abandoned infants	**Child Abuse**
	Sexual abuse	Sexual abuse	
	Skeletal survey usefulness in physical abuse	Psychological and emotional abuse	
	Child abuse case scenarios and discussions workshop	Child abuse case scenarios and discussions workshop	
Special Considerations in the Pediatric ED	Emergencies associated with genetic syndrome	Serious skin infection	**Dermatology**
	Telephone triage	Common dermatological findings in the pediatric ED	
	Crying infants	Infectious and contagious rash	
		Visual session of common rash: their diagnoses and treatment	
Preparation for EXAM	Preparation for MCQS	Approaching apost-transplant patients	**Transplant**
		Early recognition and emergency management of acute rejection	
		Major emergency medicine post-transplant	

Preparation for EXAM	Preparation for OSCE	Eye trauma	**Ophthalmology**
		Common eye emergencies	
		Chemical eye injuries	
		Red eye	
		Ophthalmology procedures workshop	

Suggested Rounds for F1 and F2
Grand Round
Trauma Round
Morbidity and Mortality Round
Toxicology Round
Transport Round
Radiology Round
EBM Round or Journal Club

Formal teaching sessions: an example:

Date					
Presenter	Activity	Time	Theme	Center	
	Welcome	0800 - 0830	Orientation		Week 1
	About the PEM Program in Saudi Arabia	0830 - 0900			
	One-year experience in the PEM fellowship	0900 - 0930			
Break		0930 - 0945			
	Electronic resources in our training	0945 - 1000			
	How to give a good presentation	1000 - 1030			

Date					
Presenter	Activity	Time	Theme	Center	
	Neonatal resuscitation	0800 - 0830	Resuscitation		Week 2
	Pediatric advanced life support	0830 - 0900			
	2015 AHA, ERC Resuscitation Guideline Update	0900 - 1000			
Break		1000-1015			
STAFF	Shock review **"mock codes"**	1015 - 1130			
	Simulation orientation	1130 - 1230			
Break and Prayer Time		1230 - 1300			
STAFF	Introduction to the EBM	1300 - 1400			

Date					
Presenter	Activity	Time	Theme	Center	
	Pharmacology in resuscitation	0800 - 0830	Resuscitation		Week 3
	Pain management in the ED	0830 - 0900			
	Monitoring the sick patient	0900 - 0930			
Break		0930 - 0945			
	Procedural sedation **"case discussion"**	0945 - 1100			
	Airway management	1100 - 1200			
Break and Prayer Time		1200 - 1230			
STAFF	Writing a new ED protocol **"Administration"**	1230 - 1400			

Date			
Simulation[1]			
Center	Groups	Time	Week 4
KKUH	GROUP A	0800 - 1300	
KFMC	GROUP B		
KASCH	GROUP C		
KSMC	GROUP D		

3.4 Universal Topics

3.4.1 Intent

These are high-value, interdisciplinary topics of the utmost importance to the trainee. The reason for delivering these topics centrally is to ensure that every trainee receives high-quality teaching and develops essential core knowledge. These topics are common to all specialties, and the topics included here meet one or more of the following criteria:

- Impactful: topics that are common or life-threatening
- Interdisciplinary: topics that are difficult to teach in a single discipline
- Practical: topics that trainees will encounter in hospital practice

3.4.2 Development and Delivery

These topics will be developed and delivered by the Commission centrally via an e-learning platform, which is didactic and focuses on practical aspects of care. These topics will be more content-heavy than workshops and other face-to-face interactive sessions. The suggested duration for each topic is 90 minutes. The topics will be delivered in a modular fashion via e-learning. An online formative assessment will need to be completed at the end of each learning unit. Upon completion of all the topics, trainees will have to complete a combined summative assessment in the form of context-rich multiple-choice questions (MCQs). All trainees must attain minimum competency in the summative assessment.

Alternatively, these topics can be assessed in a summative manner alongside a specialty examination. The titles of these universal topics are listed and described in the following modules:

3.4.3 Module 1: Introduction

1. Safe drug prescription
2. Hospital-acquired infections (HAIs)
3. Sepsis, systemic inflammatory response syndrome (SIRS), and disseminated intravascular coagulation (DIC)
4. Antibiotic stewardship
5. Blood transfusion

1. Safe Drug Prescription

Upon completion of the learning unit, the trainee should be able to do the following:

a) Recognize the importance of prescribing safe drugs in healthcare.
b) Describe various adverse drug reactions with examples of commonly prescribed drugs that can cause such reactions.
c) Apply principles of drug-drug interactions, drug-disease interactions, and drug-food interactions to common situations.
d) Apply principles of prescribing drugs to special situations such as renal and liver failure.
e) Apply principles of prescribing drugs to elderly, pediatric, pregnant, and lactating patients.
f) Promote evidence-based, cost-effective prescription.
g) Discuss ethical and legal frameworks governing safe drug prescription in Saudi Arabia.

2. Hospital-Acquired Infections (HAIs)

Upon completion of the learning unit, the trainee should be able to do the following:

a) Discuss the epidemiology of HAIs with special reference to Saudi Arabia.
b) Recognize HAIs as one of the major emerging threats in healthcare.
c) Identify the common sources of HAIs.
d) Describe the risk factors for common HAIs such as ventilator-associated pneumonia, methicillin-resistant *Staphylococcus aureus*, central line-associated bloodstream infection, and vancomycin-resistant enterococcus.
e) Identify the role of healthcare workers in the prevention of HAIs.
f) Determine appropriate pharmacological (e.g., selected antibiotic) and non-pharmacological (e.g., removal of indwelling catheter) measures in the treatment of HAI.
g) Propose a plan to prevent HAIs in the workplace.

3. Sepsis, SIRS, and DIC

Upon completion of the end of the learning unit, the trainee should be able to do the following:

a) Explain the pathogenesis of sepsis, SIRS, and DIC.
b) Identify the patient-related and non-patient-related predisposing factors for sepsis, SIRS, and DIC.
c) Recognize patients at risk of developing sepsis, SIRS, and DIC.
d) Describe the complications of sepsis, SIRS, and DVC.
e) Apply the principles of management of patients with sepsis, SIRS, and DIC.
f) Describe the prognosis of sepsis, SIRS, and DIC.

4. Antibiotic Stewardship

Upon completion of the learning unit, the trainee should be able to do the following:

a) Recognize antibiotic resistance as one of the most pressing global public health threats.
b) Describe the mechanism of antibiotic resistance.
c) Determine appropriate and inappropriate use of antibiotics.

d) Develop a plan for safe and proper antibiotic use, including indications, duration, types of antibiotic, and discontinuation.
e) Apprise oneself of the local guidelines for the prevention of antibiotic resistance.

5. Blood Transfusion

Upon completion of the learning unit, the trainee should be able to do the following:
a) Review the different components of blood products available for transfusion.
b) Recognize the indications and contraindications of blood product transfusion.
c) Discuss benefits and risks of as well as alternatives to transfusion.
d) Obtain consent for specific blood product transfusion.
e) Perform steps necessary for safe transfusion.
f) Develop an understanding of the special precautions and procedures necessary during major transfusions.
h) Recognize transfusion-associated reactions and provide immediate management.

3.4.4 Module 2: Acute Care

1. Preoperative assessment
2. Post-operative assessment
3. Acute pain management
4. Chronic pain management
5. Management of electrolyte imbalances

1. Preoperative Assessment

Upon completion of the learning unit, the trainee should be able to do the following:
a) Describe the basic principles of pre-operative assessment.
b) Perform pre-operative assessment of uncomplicated patients, with particular emphasis on the following:
    1) General health assessment
    2) Cardiorespiratory assessment
    3) Medication and medical device assessment
    4) Drug allergy
    5) Pain relief requirements
c) Categorize patients according to risk of post-operative complication

2. Post-operative Care

Upon completion of the learning unit, the trainee should be able to do the following:
a) Devise a post-operative care plan that includes monitoring vital signs, pain management, fluid management, medication, and laboratory investigations.
b) Transfer patients over to the appropriate facilities properly.
c) Describe the process of post-operative recovery.
d) Identify common post-operative complications.
e) Monitor patients for possible post-operative complications.
f) Initiate immediate management of post-operative complications.

3. Acute Pain Management

Upon completion of the learning unit, the trainee should be able to do the following:
a) Review the physiological basis of pain perception.
a) Proactively identify patients in acute pain.

c) Assess patients with acute pain.
d) Apply the various pharmacological and non-pharmacological modalities available for acute pain management.
e) Provide adequate pain relief for uncomplicated patients with acute pain.
f) Identify and refer patients with acute pain who could benefit from specialized pain services.

4. Chronic Pain Management

Upon completion of the learning unit, the trainee should be able to do the following:

a) Review the biopsychosocial and physiological bases of chronic pain perception.
b) Discuss the various pharmacological and non-pharmacological options available for chronic pain management.
c) Provide adequate pain relief for uncomplicated patients with chronic pain.
d) Identify and refer patients with chronic pain who could benefit from specialized pain services.

5. Management of Acid-Base Electrolyte Imbalances:

Upon completion of the learning unit, the trainee should be able to do the following:

a) Review the physiological basis of electrolyte and acid-base balance in the body.
b) Identify diseases and conditions associated with or likely to cause acid-base and electrolyte imbalances.
c) Correct electrolyte and acid-base imbalances.
d) Perform careful calculations, checks, and other safety measures while correcting acid-base and electrolyte imbalances.
e) Monitor the response to therapy by obtaining the medical history, performing physical examinations, and initiating selected laboratory investigations.

3.4.5 Module 3: Ethics and Healthcare

1. Occupational hazards for healthcare workers
2. Evidence-based approach to smoking cessation
3. Patient advocacy
4. Ethical issues: transplantation/organ harvesting and withdrawal of care
5. Ethical issues: treatment refusal and patient autonomy
6. Role of doctors in death and dying

1. Occupational Hazards for Healthcare Workers:

Upon completion of the learning unit, the trainee should be able to do the following:

a) Recognize common sources and risk factors of occupational hazards for healthcare workers.
b) Describe common occupational hazards in the workplace.
c) Develop familiarity with legal and regulatory frameworks governing occupational hazards for healthcare workers.
d) Develop a proactive attitude toward the promotion of workplace safety.
e) Protect him/herself and colleagues against potential occupational hazards in the workplace.

2. Patient Advocacy:
Upon completion of the learning unit, the trainee should be able to do the following:
a) Define patient advocacy.
b) Recognize patient advocacy as a core value governing medical practice.
c) Describe the role of the patient advocate in the care of patients.
d) Develop a positive attitude toward patient advocacy.
e) Be a patient advocate in conflicting situations.
f) Be familiar with local and national patient advocacy groups.

3. Ethical Issues: Transplantation/Organ Harvesting and Withdrawal of Care:
Upon completion of the learning unit, the trainee should be able to do the following:
a) Apply key ethical and religious principles governing organ transplantation and withdrawal of care.
b) Be familiar with the legal and regulatory guidelines regarding organ transplantation and withdrawal of care.
c) Counsel patients and families while considering the applicable ethical and religious principles.
d) Guide patients and families in making informed decisions.

4. Ethical Issues: Treatment Refusal and Patient Autonomy:
Upon completion of the learning unit, the trainee should be able to do the following:
a) Predict situations in which patients or their families are likely to decline prescribed treatment.
b) Describe the concept of the "rational adult" in the context of patient autonomy and treatment refusal.
c) Analyze key ethical, moral, and regulatory dilemmas pertaining to treatment refusal.
d) Recognize the importance of patient autonomy in the decision-making process.
e) Counsel patients and families who decline medical treatment regarding the best interests of the patients.

5. Role of Doctors in Death and Dying:
Upon completion of the learning unit, the trainee should be able to do the following:
a) Recognize the important role a physician can play during the dying process.
b) Provide emotional and physical care to dying patients and their families.
c) Provide appropriate pain management for dying patients.
d) Identify patients suitable for referral to palliative care services and make appropriate referrals.

3.5 Mandatory Courses and Workshops

The following list of courses and workshops are mandatory to enhance the trainee's skills during training:
1. **Advanced Trauma Life Support Course (ATLS):** The Advanced Trauma Life Support course teaches a systematic, concise approach regarding the early care of the trauma patient. This course is vital in guiding care for the injured patient in the ED. **Duration:** 3 days
2. **Pediatric Advanced Life Support (PALS):** The Pediatric Advanced Life Support Course is for healthcare providers who respond to emergencies in infants and children. **Duration:** 2 days

3. **Neonatal Resuscitation Program (NRP)**: The trainee will be provided with knowledge and skills to evaluate and resuscitate the newborn immediately after delivery. **Duration:** 1 day
4. **Difficult Airway Workshop:** The trainee will be provided with knowledge and skills to make the appropriate decision when facing a difficult airway scenario. **Duration:** 1 day
5. **Point-of-care Ultrasound (POCUS):** An introduction to point-of-care ultrasound, in which fellows learn the six basic diagnostic assessments (including trauma, cardiac, gallbladder, aorta, pelvic, and deep vein thrombosis) and procedural guidance (such as peripheral or central venous catheter insertion) using ultrasound. **Duration:** 1–2 days
6. **Procedural Sedation Course:** The course covers common therapeutic agents and the finer points of sedation in the ED setting and includes key pearls and avoidable pitfalls. **Duration:** 1 day
7. **Evidence-Based Medicine (EBM) Foundation Course**: Completion of the evidence-based medicine course is a requirement for all fellows, as stipulated by the SCFHS. The course focuses on the principles of EBM, electronic evidence searches, and critical appraisal skills. **Duration:** 3 days

3.6 Other Suggested Optional Courses

1. **Reading a Head CT Scan Workshop: What Every Emergency Physician Needs to Know**
   The course teaches fellows how to read CT scans of the head through case-based discussion. The case studies include trauma, fractures, hemorrhage, infarcts, edema, and shear injuries. It also covers methods for avoiding errors associated with reading CT scans of the head. **Duration:** 1 day

2. **Mechanical Ventilation Workshop**
   This workshop teaches fellows the basics of mechanical ventilation physiology. Upon completion, the workshop participants should be able to understand the different modes of ventilation, set up a ventilator, and ventilate patients with specific diseases. **Duration:** 2 days

3. **Advanced Cardiovascular Life Support Course (ACLS)**
   The Advanced Cardiovascular Life Support Course teaches systematic management of cardiopulmonary arrest and other cardiovascular emergencies. **Duration:** 2 days

4. **Basic Life Support (BLS)**
   The Basic Life Support Course teaches systematic management of cardiopulmonary arrest. **Duration:** 1 day

5. **Introduction to the Clinical Research Course**
   This introduction to clinical research teaches the development of research ideas, research methodology, and basic statistics for scientific research. **Duration:** 2–3 days

4. ASSESSMENT OF TRAINEES[12]

4.1 Purposes of Assessment

- Drive trainees toward learning
- Optimize the trainees' capabilities by providing motivation and direction for future learning
- Ensure that trainees fulfill the pre-defined rotation objectives and requirements in the form of knowledge, skills, and attitudes
- Ensure and document that the PEM fellow is eligible for promotion to the next level
- Ensure that the PEM fellow, upon completion of training, is able to work as a safe, competent, and independent practitioner
- Evaluate the quality of the training program

4.2 General Principles

- The assessor`s Judgment should be based on holistic profiling of a trainee rather than individual traits or instruments.
- Assessment should be continuous.
- The PEM fellow and faculty must meet to review the fellow's performance.
- Assessment should be strongly linked to the curriculum and course content.
- The PEM fellow's evaluation and assessment throughout the program is undertaken in accordance with the Commission's training and examination rules and regulations.
- For ease in organization, assessment will be further classified into two main categories: Formative and Summative.

4.3 Formative assessment:

Trainees, as an adult learner, should strive for feedback throughout their journey of competency from "novice" to "mastery" levels. Formative assessment (also referred to as continuous assessment) is the component of assessment that is distributed throughout the academic year and primarily aims to provide trainees with effective feedback. Input from the overall formative assessment tools will be utilized at the end of the year to make the decision of promoting each individual trainee from the current to the subsequent training level. Formative assessment will be defined on the basis of the scientific committee recommendations (usually updated and announced for each individual program at the start of the academic year). According to the executive policy on continuous assessment (available online: www.scfhs.org), formative assessment will have the following features:

a. Multisource: minimum four tools
b. Comprehensive: covering all learning domains (knowledge, skills, and attitude)
c. Relevant: focusing on workplace-based observations
d. Competency-milestone oriented: reflecting the trainee's expected competencies that matches the trainee's developmental level

Trainees should play an active role in seeking feedback during their training. Nevertheless, trainers are expected to provide timely and formative assessment. The SCFHS will provide an e-portfolio system to enhance communication and analysis of data obtained from formative assessment.

4.3.1 Formative Assessment Tools

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

- Performance of the trainee during each shift
- Performance and participation in academic activities
- Performance in a 10–20-minute direct observation assessment of trainee-patient interactions: Trainers are encouraged to perform at least one assessment per clinical rotation, preferably near the end of the rotation. Trainers should provide timely and specific feedback to the trainee after each assessment of a trainee-patient encounter.
- Performance of diagnostic and therapeutic procedural skills by the trainee: DOPS or Multisource feedback after each procedure is mandatory.

The CanMEDS-based competencies end-of-rotation evaluation form must be completed within 2 weeks after the end of each rotation (preferably in an electronic format) and signed by at least two consultants. The PD will discuss the evaluation with the fellow, as necessary. The evaluation form will be submitted to the Regional Training Supervisory Committee of the SCFHS within 4 weeks after the end of the rotation.

The assessment tools are in the form of an educational portfolio (i.e., monthly evaluation, rotational mini-clinical evaluation exercise [Mini-CEX], case-based discussion [CBD], and 360-degree evaluation).

The academic or clinical assignments should be documented by using an electronic tracking system (e-Logbook when applicable) on an annual basis. Evaluations will be based on accomplishment of the minimum requirements of the procedures and clinical skills as determined in the program.

The end-of-year examination will be for F1. The number of examination items, eligibility, and passing score will be in accordance with the Commission's training and examination rules and regulations. Examination details and blueprint are published on the Commission website, www.scfhs.org.sa.

Table 1: List of formative assessment tools (trainees are advised to refer to the most updated tools approved by the scientific committee of the specialty)

F2	F1	Learning Aspects
• Structured oral examination (SOE) • Academic activities	• End-of-year written examination • Structured oral examination (SOE) • Academic activities	**Knowledge**
• DOPS • Mini-CEX • **OSCE**	• DOPS • Mini-CEX • **OSCE**	**Skills**
• ITER	• ITER	**Attitude**

4.4 Summative Assessment

Summative assessment is the component of assessment that primarily aims to make informed decisions regarding the trainees' competency. Compared to the feedback provided in formative assessment, summative assessment does not aim to provide constructive feedback. For further details on this section, please refer to the general bylaws and executive policy of assessment (available online: www.scfhs.org). In order to be eligible to appear for the final examinations, a trainee should be granted the "Certification of Training Completion."

4.4.1 Certification of Training Completion

In order to be eligible to appear for the final specialty examinations, each trainee is required to obtain the "Certification of Training Completion." On the basis of the training bylaws and executive policy (please refer to www.scfhs.org), trainees will be granted the "Certification of Training Completion" when the following criteria are fulfilled:

- Successful completion of all training rotations
- Completion of the training requirements as outlined by the scientific committee of the specialty (e.g. logbook, research, or others): The program's directors prepare the Final In-Training Evaluation Report for each fellow at the end of his/her final year in fellowship. This might also involve clinical and oral examinations as well as completing other academic assignment(s). In F2, this is important for promoting the fellow to appear for the final PEM fellowship examination.
- Clearance from the SCFHS training affairs that ensure compliance with tuitions payment and completion of universal topics whenever applicable

The "Certification of Training Completion" will be issued and approved by the supervisory committee or its equivalent according to the SCFHS policies.

4.4.2 Final Pediatric Emergency Medicine Fellowship Examination:

The final specialty examination is the summative assessment component that grants trainees the specialty's certification. It has the following two elements:

a. **Final written examination**: To be eligible for this examination, trainees are required to have obtained the "Certification of Training Completion." This examination assesses the theoretical knowledge base (including recent advances) and problem-solving capabilities of candidates in the specialty of PEM. The examination is delivered in a multiple-choice question format and is held at least once a year. The number of examination items, eligibility, and passing score will be in accordance with the Commission's training and examination rules and regulations. Examination details and blueprint are published on the Commission website, *www.scfhs.org.sa.*
b. **Final clinical examination:** Trainees will be required to pass the final written examination in order to be eligible to appear for the final clinical examination. The examination assesses a broad range of high-level clinical skills, including data gathering, patient management, and communication and counseling skills. The examination is held at least once a year, preferably in an objective structured clinical examination (OSCE) format, as well as a structured oral examination (SOE) in the form of patient management problems. The examination eligibility and passing score will be in accordance with the Commission's training and examination rules and regulations. Examination details and blueprint are published on the Commission website, *www.scfhs.org.sa.*

4.5 Certification:

Candidates passing all components of the final specialty examination are awarded the "Pediatric Emergency Medicine Saudi Fellowship certificate."

APPENDICES

Appendix A

Pediatric Emergency Rotation
Shift Evaluation

- **The form should be completed by the end of your clinical shift and drop off in the appropriate mailbox that allocated in the Pediatric Emergency Department.**
- **This form will be also your record for attendance.**

Trainee part
Name of Trainee:
Program: ☐ **PEM fellowship**
Level: Fellow: ☐ **F1** ☐ **F2**
Rotation:
Date: ***(Circle below)***

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

Month: ***(Circle below)***

12	11	10	9	8	7	6	5	4	3	2	1

Shift Time: ☐ **Morning** ☐ **Evening** ☐ **Night**
Number of Observed Assessments this Shift:
Number of Procedures performed this Shift:

Comment	**Procedure**

Evaluator Part
Trainee attend the shift on time: ☐ Yes ☐ No *If **No** what is your the action?*

Evaluation/ Assessment *(Circle one below)*

① Below Expectation ② Some Development Needed ③ Meet Expectations ④ Exceeds Expectations/Outstanding

Performance				Criteria
4	3	2	1	1. **Clinical**: assessment
4	3	2	1	2. **Clinical**: Management
4	3	2	1	3. **Communication Skills**
4	3	2	1	4. **Collaboration**: Team Skills
4	3	2	1	5. **Scholar**: Teaching (if Applicable)
4	3	2	1	6. **Manager**: Time & Resource
4	3	2	1	7. **Health Advocate**: Patient needs, illness factors & prevention
4	3	2	1	8. **Professional behaviors**
4	**3**	**2**	**1**	**Overall Performance**

Feedback

Areas to work on:	Strengths:

Signature **Evaluator Name**

Appendix B

Educational Portfolio

Reflection Form

Rotation (____): Comprehensive PEM

1. **Clinical Management:**
   - Strengths:
   - Areas of Improvement:
   - New Skills:

2. **Medical Practice:**
   - Strengths:
   - Areas of Improvement:
   - New Skills:

3. **Professionalism:**
   - Strengths:
   - Areas of Improvement:
   - New Skills:

4. **Communication Skills:**
   - Strengths:
   - Areas of Improvement:
   - New Skills:

5. **Leadership and Teamwork:**
   - Strengths:
   - Areas of Improvement:
   - New Skill:

APPENDIX C[12]

Evaluated : evaluator's name: By Evaluating : person (role) or moment's name (if applicable): Dates :start date to end date:	 Saudi Commission for Health Specialties

* indicates a mandatory response
Mini-Clinical Evaluation Exercise (Mini-CEX)
*Brief Summary of the Case:

Above expectation (4)	Meets expectations (3)	Borderline (2)	Below expectations (1)	n/a	
○	○	○	○	○	***1) Medical Interview Skills**
○	○	○	○	○	***2) Physical Examination Skills**
○	○	○	○	○	***3) Counselling and Communications Skills**
○	○	○	○	○	***4) Clinical Judgement**
○	○	○	○	○	***5) Consideration for Patient/Professionalism**
○	○	○	○	○	***6) Organization/Efficiency**
○	○	○	○	○	***7) Overall Clinical Competence**

***Comments:**

***Which aspects of the encounter were done well?**

***Suggested areas for improvement / development?**

***Agreed Actions / learning plan:**

***Fellow's reflections on patient and areas of learning:**

*Assessor's position:
- Consultant

*Time taken for Observation & Feedback (in minutes):

The following will be displayed on forms where feedback is enabled...
(for the evaluator to answer...)

*Did you have an opportunity to meet with this fellow to discuss their performance?
- Yes
- No

(for the evaluee to answer...)

*Are you in agreement with this assessment?
- Yes
- No

Please enter any comments you have (if any) on this evaluation:

APPENDIX D

Portfolio Assessment

This form is to be completed every month during the mentoring/supervision meeting with the fellow.

Fellow Name: …… Level: ……..…

Mentor Name: ……..…. Date: …… Time ……

Clinical Rotation: …… Site of Rotation:……..… Duration:……

Remarks	Scoring 0 = Poor ↔ 4 = outstanding					Achievement Required	Domain	
	2		1		0	Did the fellow perform a minimum of 2 Mini-CEX last month?	Minimum number achieved	Mini-CEX (2/month)
	4	3	2	1	0	What were the average results of the assessment?	Competency assessment score	
	2		1		0	Did the fellow perform a minimum of 2 DOPs last month?	Minimum number achieved	DOPs (2/month)
	4	3	2	1	0	What were the average results of the assessment?	Competency assessment score	
	4	3	2	1	0	Did the fellow complete at least one sheet for the learning objectives, for an average of 2–3 objectives every week with feedback and signed by the trainer?	Learning contract/objectives (2–3 objectives/week)	
	4	3	2	1	0	Did the fellow show any document of self-directed learning (e.g., CME, topic review, course, and workshop)?	Evidence of self-directed learning	
/50	/18					**Overall assessment of portfolio**		

Comments:

……

……

……

……

……

……

Assessor's signature: …….. Trainee's signature: ……

- **Original for program secretary/fellow file**
- **Copy for the fellow**

APPENDIX E[12]

Evaluated : evaluator's name: By Evaluating : person (role) or moment's name (if applicable): Dates :start date to end date:	 Saudi Commission for Health Specialties

* indicates a mandatory response
Direct Observation of Procedural Skills – DOPSAssessment
*Name of the Procedure:

Above expectation 4	Meets expectations 3	Borderline 2	Below expectations 1	n/a	
○	○	○	○	○	***Domain & Comments: Professional Approach (to include communication, consent and consideration of the patient.)**
○	○	○	○	○	***Knowledge (indication, anatomy, technique)**
○	○	○	○	○	***Demonstrate appropriate pre-procedure preparation**
○	○	○	○	○	***Appropriate analgesia or/and sedation**
○	○	○	○	○	***Technical Ability**
○	○	○	○	○	***Aseptic Technique**
○	○	○	○	○	***Post Procedure Management**

Competent to perform unsupervised	May need supervision if complications arise	Needs more practice	
○	○	○	***Overall Ability to perform Procedure:**

*Comments:

*Assessor's position:
○ Consultant

*Complexity of procedure:
Low
Average
High
*Time taken for Feedback & Observation (in minutes):

The following will be displayed on forms where feedback is enabled...
(for the evaluator to answer...)

*Did you have an opportunity to meet with this fellow to discuss their performance?
Yes
No

(for the evaluee to answer...)

*Are you in agreement with this assessment?
Yes
No

Please enter any comments you have (if any) on this evaluation.

APPENDIX F

Topics list

a. Resuscitation

i. Advance Preparation for Pediatric Resuscitation
   1. Triage criteria/guidelines
   2. Roles/responsibilities/composition of the resuscitation team
   3. Equipment and facility preparation

ii. Pediatric Basic and Advanced Life Support
   1. Epidemiology/etiology
   2. Anatomy and pathophysiology (pediatric differences)
   3. General approach for recognition and management
   4. Airway management (noninvasive/invasive)
   5. Cardiac resuscitation (e.g., compressions and defibrillation)
   6. Vascular access
   7. Pharmacologic management
   8. Complications
   9. Post-resuscitation care

iii. Neonatal Resuscitation
   1. Epidemiology/etiology
   2. Anatomy and pathophysiology (age-related differences)
   3. General approach for recognition and management
   4. Airway management (noninvasive/invasive)
   5. Cardiac resuscitation (e.g., compressions and defibrillation)
   6. Vascular access
   7. Pharmacologic management
   8. Complications
   9. Post-resuscitation care
   10. Specific neonatal complications (hypothermia, hypoglycemia, meconium, and congenital anomalies)
   11. Emergency department delivery

iv. Shock
   1. Epidemiology/etiology/classification
   2. General approach for recognition and management
   3. Vascular access
   4. Fluid resuscitation
   5. Pharmacologic management
   6. Complications
   7. Post-resuscitation care

v. Sedation and Analgesia
   1. General principles
   2. Patient selection
   3. Monitoring
   4. Non-pharmacologic management
   5. Pharmacologic management
   6. Complications
   7. Disposition/discharge criteria

vi. Emergency Anesthesia and Airway Management
   1. Airway assessment
   2. Noninvasive airway techniques
   3. Invasive airway techniques
   4. Rapid sequence induction
   5. Ventilation in the ED

b. Medical Emergencies

i. Neurologic Emergencies
   1. Signs/symptoms: coma, altered mental status, headache, dizziness/vertigo, ataxia, weakness, syncope, and hypotonia
   2. Seizures
   3. Encephalopathies
   4. Disorders of motor function
   5. Disorders of balance
   6. Movement disorders
   7. Cranial nerve disorders

ii. Cardiac Emergencies
   1. Signs/symptoms: chest pain, palpitations, murmur, syncope, cyanosis, hypotension, and hypertension
   2. Congestive heart failure
   3. Rhythm disorders
   4. Pericardial disorders
   5. Myocardial disorders
   6. Infectious endocarditis
   7. Congenital heart disease
   8. Hypertension

iii. Respiratory Emergencies
   1. Signs/symptoms: apnea, respiratory distress, wheeze, cough, stridor, and grunting
   2. Asthma
   3. Bronchiolitis
   4. Pneumonia
   5. Cystic fibrosis
   6. Congenital disorders
   7. Upper airway obstruction

iv. Infectious Disease Emergencies
   1. Fever
   2. Bacteremia/sepsis
   3. CNS infections
   4. Upper respiratory tract infections
      a. Nasopharyngitis
      b. Stomatitis
      c. Pharyngitis
      d. Otitis media
      e. Otitis externa
      f. Sinusitis
      g. Peritonsillar abscess
      h. Cervical lymphadenitis

i. Retropharyngeal abscess
j. Croup
k. Epiglottitis
l. Bacterial tracheitis

5. Lower respiratory tract infections
   a. Pneumonia
   b. Bronchiolitis
   c. Pertussis
   d. Tuberculosis
6. Gastrointestinal infections
   a. Viral gastroenteritis
   b. Bacterial gastroenteritis
   c. Antibiotic-associated colitis
7. Skin, soft tissue, and bone infections
   a. Impetigo
   b. Lymphadenitis
   c. Cellulitis
   d. Omphalitis
   e. Neonatal mastitis
   f. Septic arthritis
   g. Osteomyelitis
8. Genitourinary Infections
9. Nonbacterial Systemic Infections
   a. Viral syndrome
   b. Measles
   c. Rubella
   d. Poliomyelitis
   e. Varicella zoster
   f. Roseola
   g. Erythema infectiosum
   h. Infectious mononucleosis
   i. Rocky Mountain spotted fever
10. Other infections
    a. Human immunodeficiency virus
    b. Rabies
    c. Tetanus
    d. Botulism
    e. Diphtheria
    f. Toxic shock syndrome
    g. Malaria

v. Renal and Electrolyte Emergencies
   1. Dehydration
   2. Electrolyte disorders
   3. Nephrotic syndrome
   4. Acute glomerulonephritis
   5. Hypertension
   6. Acute renal failure
   7. Chronic renal failure
   8. Hemolytic-uremic syndrome

9. Henoch–Schönlein purpura
10. Renal tubular acidosis
11. Urolithiasis

vi. Metabolic Emergencies
1. Signs/symptoms: odors and acidosis/alkalosis
2. Urea cycle disorders
3. Organic acidurias
4. Galactosemia

vii. Endocrine Emergencies
1. Signs/symptoms: hypoglycemia and polydipsia/polyuria
2. Diabetic ketoacidosis and diabetes mellitus
3. Hypopituitarism
4. Adrenal insufficiency
5. Congenital adrenal hyperplasia
6. Pheochromocytoma
7. Diabetes insipidus
8. Syndrome of inappropriate antidiuretic hormone secretion
9. Hyperparathyroidism and hypoparathyroidism
10. Rickets
11. Thyroid storm
12. Neonatal thyrotoxicosis
13. Congenital hypothyroidism

viii. Hematologic and Oncologic Emergencies
1. Signs/symptoms: pallor, lymphadenopathy, hepatosplenomegaly, mass, bruising, and bleeding
2. Disorders of red blood cells
3. Disorders of hemoglobin structure and function
4. Disorders of white blood cells
5. Disorders of platelets
6. Disorders of coagulation
7. Splenic disorders
8. Blood product transfusions
9. Diagnosis and initial care of common childhood malignancies
10. Complications of oncologic therapy and progressive disease

ix. Toxicological Emergencies
1. General approach
2. Nontoxic ingestions
3. Common ingestions (acetaminophen, acetyl salicylic acid, alcohols, antihistamines, cardiac drugs, disc batteries, foods/fish, household cleaning products and caustics, hydrocarbons, isoniazid, iron, lead, oral hypoglycemic agents, organophosphates, phenothiazines, plants, mushrooms, theophylline, tricyclics, and antidepressants)
4. Substance abuse

x. Environmental Emergencies
1. Hypothermia
2. Hyperthermia
3. Electrical injuries
4. Radiation
5. Barometric injuries

6. Drowning/near-drowning
7. Smoke inhalation
8. Carbon monoxide poisoning

xi. Bites and Stings
1. Marine invertebrates
2. Marine vertebrates
   a. Sharks
   b. Stingrays
   c. Other
3. Terrestrial invertebrates
4. Terrestrial vertebrates
   a. Reptiles
   b. Mammals

xii. Allergic Emergencies
1. Asthma
2. Anaphylaxis
3. Serum sickness
4. Allergic rhinitis
5. Urticaria/hives

xiii. Gastrointestinal Emergencies
1. Signs/symptoms: abdominal pain, abdominal distension, mass, constipation, diarrhea, jaundice, vomiting (neonate/child), and anorexia
2. Ingestion of foreign bodies
3. Upper gastrointestinal bleeding
4. Lower gastrointestinal bleeding
5. Hepatosplenomegaly
6. Inflammatory bowel disease
7. Reye's syndrome
8. Biliary tract disease
9. Pancreatitis
10. Hepatitis

xiv. Gynecologic Emergencies
1. Signs/symptoms: amenorrhea, oligomenorrhea, menorrhagia, vaginal bleeding, and vaginal discharge
2. Congenital disorders
3. Labial adhesions
4. Urethral prolapse
5. Dysmenorrhea
6. Dysfunctional uterine bleeding
7. Sexual abuse and assault
8. Genital tract infections (sexually transmitted diseases and pelvic inflammatory disease)
9. Pregnancy

xv. Dermatologic Emergencies
1. Signs/symptoms: rash (macular, papular, pustular, vesicular/bullous, eczematous, papulosquamous, purpura, and petechial)
2. Atopic dermatitis
3. Seborrheic dermatitis
4. Allergic contact dermatitis

5. Drug reactions
6. Erythema multiforme
7. Staphylococcal scalded skin syndrome
8. Bites/infestations (scabies, and lice and spider bites)
9. Fungal infections
10. Pyogenic granuloma
11. Urticaria
12. Pityriasis rosea
13. Panniculitis
14. Warts and molloscum contagiosum
15. Congenital herpes simplex virus
16. Disorders of pigmentation
17. Congenital lesions (e.g., hemangioma, nevi, and neurocutaneous syndromes)

xvi. Rheumatologic Emergencies
1. Signs/symptoms: arthralgia, arthritis, and back pain
2. Juvenile rheumatoid arthritis
3. Systemic lupus erythematosus
4. Dermatomyositis
5. Scleroderma
6. Vasculitis
7. Kawasaki disease
8. Lyme disease

c. Psychiatric/Psychosocial Emergencies

i. Child abuse
ii. Psychiatric emergencies
1. Depression
2. Suicide
3. Psychosis
4. Post-traumatic stress disorder
5. Dissociative disorders
6. Conduct disorder
7. School refusal
8. Attention deficit hyperactivity disorder
9. Disorders in infancy (excessive crying, sleep disorders, and attachment disorders)

iii. Care of the Family
1. Sudden death (epidemiology of sudden deathand management of the family)
2. Catastrophic illness
3. Community resources

iv. Adolescent Emergencies
1. General considerations
2. Eating disorders
3. Rape/sexual assault/sexual abuse
4. Teenage suicide
5. Substance abuse

v. Behavioral Problems
1. Hyperventilation syndrome
2. Infant rumination syndrome
3. Breath-holding spells

4. Sleep disturbances
5. Head banging

d. Trauma

i. General Objectives
   1. Prevention
   2. Epidemiology/patterns of injury
   3. Approaching the injured child
   4. Triage and trauma scoring
   5. Pre-hospital care and transport of the injured child
   6. Trauma team
   7. Environmental factors (hypo/hyperthermia, drowning, and smoke inhalation)

ii. Major Trauma
   1. General approach
   2. Primary and secondary surveys
   3. C-spine immobilization and assessment
   4. Airway management in major trauma
   5. Specific problems in multiple trauma
      a. Airway trauma
      b. Tension pneumothorax/hemothorax
      c. Cardiac tamponade
      d. Penetrating trauma
      e. Hemorrhage
      f. Limb-threatening injuries
   6. Investigations (priority, selection, and interpretation)
   7. Management
   8. Disposition/transfer

iii. Head trauma
iv. Neck trauma
v. Thoracic trauma
vi. Abdominal trauma
vii. Genitourinary trauma
viii. Facial trauma
ix. Eye trauma
x. Ear-nose-throat trauma
xi. Dental trauma
xii. Burns
xiii. Orthopedic trauma
xiv. Minor trauma and wound care

e. Surgical Emergencies

i. Minor Lesions
   1. Eponychia/paronychia
   2. Subungual splinter
   3. Felon
   4. Cysts and abscesses
   5. Regional lesions (facial, pre-auricular, neck, tongue, trunk, and perineal regions)
   6. Removal of foreign bodies
   7. Minor amputations

ii. Abdominal emergencies
    1. Peritonitis
        a. Appendicitis
        b. Meckel's diverticulitis
        c. Primary peritonitis
        d. Pancreatitis
    2. Obstruction
        a. Acute causes (appendicitis, intussusception, hernia, malrotation/volvulus, pyloric stenosis, and adhesions)
        b. Chronic causes (constipation, Hirschsprung's disease, duplications, and inflammatory bowel disease)
    3. Rectal bleeding (fissures, polyps, Meckel's diverticulum, and Henoch–Schönlein purpura)
    4. Masses
    5. Abdominal wall defects
    6. Foreign bodies
iii. Neurosurgical emergencies
    1. Congenital anomalies
    2. Hydrocephalus, raised intracranial pressure, and shunt malfunction
    3. Infection (shunt, meningitis, abscess, and viral)
    4. Hemorrhage (aneurysm, arteriovenous malformation, and angiomas)
    5. Stroke
    6. Neoplasia
    7. Spinal cord compression
iv. Thoracic emergencies
    1. Airway obstruction (tracheal, bronchial, and esophageal)
    2. Foreign bodies
    3. Pleural collections (air, fluid, blood, and masses)
    4. Intrinsic lesions of the lungs
    5. Mediastinal tumors
    6. Diaphragmatic defects
    7. Chest wall tumors
v. Ophthalmologic emergencies
    1. Signs/symptoms: visual disturbance/loss, red eye, painful eye, and eye discharge
    2. Chemical injury
    3. Conjunctivitis
    4. Cellulitis
    5. Chalazions and styes
    6. Foreign bodies
vi. Ear-nose-throat emergencies
    1. Signs/symptoms: sudden hearing loss, vertigo, stridor, mass, epistaxis, sore throat, halitosis, ear pain, and nasal discharge
    2. Infections
    3. Neoplasms
    4. Post-tonsillectomy and adenoidectomy hemorrhage
    5. Foreign bodies
    6. Other disorders

vii. Urologic emergencies
    1. Signs/symptoms: penile or scrotal pain and swelling, discharge, dysuria, and hematuria, and the frequency of these signs/symptoms
    2. Penile problems (phimosis/paraphimosis, balanitis, priapism, meatal stenosis, and trauma)
    3. Testicular problems (torsion, retractile testis, undescended testis, varicocele, and epididymitis)
    4. Urinary tract infections
    5. Sexually transmitted diseases
    6. Acute urinary retention
viii. Orthopedic emergencies
    1. Signs/symptoms: limb pain, limping, and swelling
    2. Infection (bones and joints)
    3. Compartment syndrome
    4. Penetrating wounds
    5. Subluxation
    6. Slipped capital femoral epiphysis
    7. Legg-Calvé-Perthes disease
    8. Osteochondroses
ix. Dental emergencies
    1. Congenital lesions
    2. Post-extraction complications
    3. Oral infections
    4. Perioral manifestations of systemic disease
x. Transplantation emergencies
    1. General principles
    2. Immunosuppression
    3. Infection and immunizations
    4. Post-transplantation emergencies

APPENDIX G

Introduction: This logbook was created for you, so please always keep it handy and fill it up. The major aim of this book is to be a reminder for you of what you have learned or mastered or that you have never practiced but that you need your supervisor to teach you how to do. The book consists of three major parts: 1- **Procedures:** where you document all procedures you have performed, observed, mastered, or taught (which is the optimum) 2- **Miscellaneous:** consists of Admin, EBM, Teaching, and Mini-Examinations. It is the fellow's responsibility to sit with the consultant to practice any one of these during each shift. 3- **Growing Knowledge:** where you fill your daily gathered new information from your patients, seniors, colleagues, or even junior residents. You should also record any raised or unanswered questions. This record will be a great reference for you if you maintain it consistently.	**Core Competency Logbook** **of** **On-Duty Daily Activity** *Pediatric Emergency Medicine Program* **Fellow's Name:** **Training Center:**

PART I: Clinical Skills (Procedures)

A- Resuscitation

Remarks	Counts					Procedure
						Trauma code
						C-Spine immobilization
						Chest tube
						Needle thoracostomy
						CPR team leader
						Chest compression
						BVM
						LMA
						Intubation
						NIV setting
						Ventilator setting
						Cardioversion
						IO
						Central line
						RSI
						PSA

B- Orthopedic Procedures (including full and back-slab cast)

Remarks	Counts					Procedure
						Arm sling/swathe
						Above elbow
						Below elbow
						Thumb spica
						Ulnar gutter
						Radial gutter
						Long leg
						Short leg
						Cast removal
						Creep bandage application
						Buddy splint (taping)
						Fracture reduction/ fingers
						Pulled elbow
						Shoulder reduction

C- Minor injuries

Remarks	Counts					Procedure
						Sutures (all types)
						Glue
						Staples
						Digital block
						Facial regional block
						Nail-bed repair
						Tongue laceration.
						Lip lac.
						Paronychia
						Trephination
						Splinter removal
						Felon I and D
						Fish hook removal
						Nasal packing
						Abscess I and D
						FB removal (nose, ear, and skin)

D- Miscellaneous

Remarks	Counts					Procedure
						Burn dressing
						Hernia reduction
						Rectal prolapse reduction
						Neb. setup
						ABG
						Urinary catheter
						Genitalia examination
						Full eye examination/fluo rescein
						Slit-lamp examination
						NGT insertion
						G-tube insertion
						LP (spinal needle)/pressure manometer
						U/S (EFAST, cardiac, testes,appendex and joints)
						Burn dressing
						Hernia reduction
						Rectal prolapse reduction

B- EBM (Discussion/Teaching)

Remarks (Junior/Senior)	Type Of Study	Title Of Article
		1-
		2-
		3-
		4-
		5-
		6-
		7-
		8-

PART II: Miscellaneous

A- Administration

Discussed			Practiced			Activity
						Flow Management/Overcrowding
						Communication
						Effective consultation
						Conflict resolution
						Upset parents
						Effective handovers (ISBARS)
						Breaking bad news
						Debriefing
						Effective feedback
						ED Quality Management
						KPIs/ IPSGs
						Patient satisfaction
						Staff satisfaction
						New ED Design
						Staffing new ED
						Disaster Management
						Time Management
						Task/Project Management

D- Clinical/Medical Case Discussion

DOPS (Direct Observed Procedure Skills)	SLIDES	MCQs	OSCE "Mini-CEX" (Medical/ Surgical/ Trauma/ Toxicological)
			1-
			2-
			3-
			4-
			5-
			6-
			7-
			8-

C- Effective Teaching (To Juniors)

Unobserved	Observes	Topic
		1-
		2-
		3-
		4-
		5-
		6-
		7-
		8-
		9-
		10-
		11-
		12-

Daily Gained Information/Questions
1-
2-
3-
4-
5-

PART III: Day-By-Day Growing Knowledge
(Daily Gained New Information/ Questions regarding EBM)

Daily Gained Information/Questions
1-
2-
3-
4-

Daily Gained Information/Questions
1-
2-
3-
4-
5-

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