EMERGENCY MEDICINE ROTATION LEARNING OBJECTIVES
Students will be placed in a hospital-based emergency room to gain exposure to urgent and emergent care. This rotation’s examination will focus on Emergency Medicine. The following pages outline the learning objectives for this clinical experience. They are designed to guide students in their clinical activities and supplemental reading. It is not the Program’s intention that students will be exposed to this complete list of objectives during the clinical experience. This section is designed to assist students in their preparation for the emergency medicine end-of-rotation exam.

EM MEDICAL KNOWLEDGE
Upon completion of this clinical experience (EM), the student will be able to:

- Understand etiology, epidemiology, risk factors and pathophysiology
- Evaluate clinical manifestations
- Formulate a differential diagnosis
- Develop an assessment (including recommendation and interpretation of laboratory, diagnostic and radiological studies/findings)
- Construct a patient-specific plan (including pharmacological/non-pharmacological, patient education, procedural and necessary referrals)
- Describe prognosis, complications, prevention, patient education, and treatment goals

of the following diseases/disorders/symptoms.

Airway Management
Recognize and recommend appropriate airway management in the conscious patient, unconscious patient, pediatric patient and the patient with facial and neck trauma.

Fluid Management
Differentiate and choose the appropriate type of IV fluids

Trauma/Shock
etiology of shock in a trauma patient
shock – hypovolemic, cardiogenic, anaphylactic, neurogenic
resuscitation fluids (crystalloids verses colloids)
blunt verses penetrating trauma
tension pneumothorax
cardiac (pericardial) tamponade
flail chest
traumatic head injury
CPR (BLS, ACLS) Protocols
C-spine clearance protocol (National Emergency X-radiography Utilization study (NEXUS) criteria)

Respiratory Emergencies
Pneumothorax, hemothorax respiratory acidosis and alkalosis
aspiration pulmonary edema
exacerbation of asthma/ COPD pneumonia (viral, bacterial and fungal)
upper airway obstruction pulmonary embolus
atelectasis pleurisy
epiglottitis retropharyngeal abscess
Identify and recommend hospital admission for respiratory emergencies using appropriate criteria.

**Cardiovascular Emergencies**
- angina pectoris
- acute myocardial infarction (AMI)
- pericardial effusion and tamponade
- hypertensive emergencies/urgencies
- pericarditis
- aortic dissection
- congestive heart failure

**EKG abnormalities:**
- Asystole
- QT prolongation
- Atrial (fibrillation, flutter)
- Sinus bradycardia, tachycardia
- PVCs
- Paroxysmal supraventricular tachycardia
- Ventricular (tachycardia, fibrillation)
- AV block (1\textsuperscript{st}, 2\textsuperscript{nd}, Complete)
- Right and left bundle branch block
- Wolf-Parkinson-White
- Torsade de Pointes

Appropriately and accurately identify and recommend and/or perform cardioversion, and defibrillation.

Identify and recommend hospital admission for cardiac emergencies through use of appropriate criteria.

**Gastrointestinal Emergencies**
- Appendicitis
- Perforated peptic ulcer
- Diverticulitis
- Abdominal aortic aneurysm
- Splenic rupture
- Esophageal varices
- Acute pancreatitis
- Mesenteric ischemia
- Infectious diarrhea
- Upper and lower gastrointestinal bleeding
- Cholecystitis/lithiasis/ biliary colic
- Acute hepatitis
- Inflammatory bowel disease/toxic megacolon

Identify and recommend hospital admission for gastrointestinal emergencies through use of appropriate criteria.

**Neurological Emergencies**
- Glasgow Coma Scale
- Levels of consciousness
- Subdural hematoma
- Intracerebral hemorrhage
Subarachnoid hemorrhage  Head trauma
Meningitis  Cerebral contusion
Encephalitis  Headache
Seizure disorders, status epilepticus  Basilar skull fracture
Acute TIA/CVA  Hepatic encephalopathy
Spinal cord injury
Guillain-Barré syndrome

Recognize and appropriately recommend the potential etiology and diagnostic approach and treatment for syncope, dizziness, and vertigo.

Identify and recommend hospital admission for neurological emergencies through use of appropriate criteria.

Musculoskeletal Trauma and Emergencies

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Types of Fractures

- Open
- pathologic
- compression
- spiral
- comminuted
- greenstick
- angulated
- transverse
- displaced articular stress
- closed avulsion
- oblique
- torus

Specific

A. Shoulder/Arm
   1) anterior/posterior shoulder dislocation
   2) acromioclavicular separation
   3) humeral fractures
   4) clavicle fractures

B. Elbow
   1) subluxation radial head (nursemaid’s elbow)
   2) Supracondylar fracture

C. Forearm/Wrist
   1) Colle’s Fracture
   2) Radial Fracture
   3) Ulnar fracture
   4) Scaphoid (Navicular) fracture

D. Hand/Finger
   1) MCP ulnar collateral ligament
   2) sprain/rupture(gamekeeper’s thumb)
   3) phalanx fractures
   4) metacarpal fractures (Boxer’s)
   5) mallet finger

E. Ankle/foot
   1) malleolar fractures
2) fifth metatarsal (Jones’)
3) calcaneous fracture

F. Leg
1) tibial fractures
2) fibular fractures
3) femur fractures

G. Salter-Harris I-V

H. Knee
1) patella fracture/dislocation

I. Facial
1) orbital blowout fracture

J. Pelvic

K. Hip
1) intra-trochanteric fracture
2) subcapital fracture
3) Slipped Capital femoral epiphysis
4) Legg-Calve-Perthes

Soft tissue trauma/injuries
- Rotator Cuff tendonitis/bursitis/tear
- Biceps tendonitis/rupture
- Anterior/posterior cruciate tear
- Patella tendon bursitis/ tendonitis
- Compartment syndrome

Medial/lateral epicondylitis
Medial/lateral collateral ligament tear
Achilles tendon rupture

Neck/Spine
- Herniation
- Spinal cord injury
- Cauda equine syndrome
- Vertebral fractures
- Whiplash
- Low back pain

Identify and recognize the most common fracture associated with the following complications:
- Osteomyelitis
- Volkmann’s ischemic contracture
- avascular necrosis
- fat emboli syndrome
- inhibited bone growth development in the pediatric patient

Wound Care
- Tetanus prophylaxis and immunization
- Primary/secondary wound closures
- Appropriate dressing and wound treatments based on wound type

Dermatologic, Burns and Environmental Emergencies
- Herpes zoster
- Erythema multiforme
- Steven-Johnson’s Syndrome
- Toxic epidermal necrolysis
- Cellulitis
- Smoke inhalation
- Burns (all forms and degrees)
Criteria for hospital and burn center admission for the burn patient
Utilization of the Rule of Nines
Heat cramps/heat exhaustion/heat stroke
Frostbite/ hypothermia

Bites/Stings: all forms
Rabies
Drug eruptions
Viral exanthems

Eye, Ear, Nose, Oral Cavity Emergencies
Epistaxis (anterior, posterior) Foreign bodies Ocular pain Retinal detachment Acute angle-closure glaucoma Central retinal artery occlusion Orbital and peri orbital cellulitis Corneal abrasion and ocular trauma Facial trauma Dental fractures/loss/avulsion/abscess Peritonsillar abscess Smiles for Life online module objectives

Acute hearing loss and otalgia Red eye Acute visual loss Chemical and thermal flash burns Hypema Otitis media/externa Acute pharyngitis/laryngitis Acute sinusitis/mastoiditis Barotrauma

Gynecologic and Obstetric Emergencies
Ectopic pregnancy Ovarian torsion Placenta previa Preeclampsia Pelvic inflammatory disease Pelvic pain

Rupture ovarian cysts Placental abruption Spontaneous abortion Eclampsia Fetal distress Mastitis/breast abscess

Genitourinary Emergencies
Glomerulonephritis Nephrolithiasis Pyelonephritis Testicular torsion

Epididymitis Acute renal failure Prostatitis Orchitis

Peripheral Vascular Emergencies
Abdominal aortic aneurysm Acute arterial occlusion Deep vein thrombosis

Endocrine Emergencies
Diabetic ketoacidosis thyroid storm myxema coma hyperglycemic hyperosmolar nonketotic syndrome acute adrenal crisis hypoglycemia hyper/hypo calcemia

Metabolic, Fluid and Electrolyte Emergencies
alcohol ketoacidosis dehydration
hyper/hypo natremia  hyper/hypo kalemia
respiratory acidosis/alkalosis  metabolic acidosis (anion and non-anion gap)/alkalosis

Toxicology
Aspirin overdose  anticholinergic overdose
Digoxin overdose  antiepileptic overdose
opiate overdose  ethanol and other toxic alcohols
cocaine overdose  carbon monoxide poisoning
amphetamine
decontamination/detoxification/antidotes
acetaminophen overdose and toxicity
sedatives and hypnotics (benzodiazepines)

Psychiatric Emergencies
Suicide/homicide ideations  Depression
Panic attack/anxiety disorders  Bipolar disorder
Psychosis  Schizophrenia
Hallucinations  Suicide attempt

Abuse
Sexual abuse  Elder abuse
Child abuse  Domestic/intimate partner violence

EM PHARMACOTHERAPEUTICS
Students will also be expected to discern the properties of the following drug or drug classes including mechanism of action, interactions, contraindications, and major and common side effects. Students will also be expected to discern the appropriate patient education and necessary follow up required for the following drugs or drug classes.
• Analgesics
• Anesthetics- topical, local
• Antianxiolytics
• Antiarrhythmics
• Antibiotics- oral, IV
• Anticoagulants
• Antidepressants
• Antidiarrheals
• Antiemetics
• Antihypertensives
• Antipsychotics
• Antispasmodics/anticholinergics
• Cardiac medications
• Corticosteroids
• Diuretics
• Ophthalmological medications
• Respiratory medications
• Thrombolytics

EM SKILLS
Recognize, perform and/or assist in the following procedures and identify the indications and potential complications (when applicable) for each:
• Airway management
• Anterior nasal packing
• Application of splints
• Application of wound dressings
• Cardiopulmonary resuscitation
• Chest tube placement
• Clearance of cervical spine
• Control of superficial hemorrhage
• Digital/field block
• Fluorescein corneal examination
• Incision and drainage
• Injections
• IV access- peripheral, central line
• Local anesthesia infiltration
• Lumbar puncture
• Nasogastric tube placement Suturing
• Removal of superficial foreign bodies
• Urinary catheterization
• Venipuncture

**EM DIAGNOSTIC STUDIES**

Students will be expected to appropriately **recommend**, **interpret** the findings, and **recognize the indications/clinical significance** of the following diagnostic studies. In addition students will be expected to discern appropriate **management** (including counseling and informed consent) when **abnormalities** are found in the following routine tests, and recognize the **potential complications** for each:

- Peak Flow
- X-ray (chest, abd, KUB)
- 12 Lead ECG& Rhythm Strip
- Stool occult blood
- CBC & Differential
- Glucose
- ESR
- BUN
- Creatinine
- Fluid Analysis
- Potassium
- AST/ALT
- Alkaline Phosphatase
- Chloride
- Blood type and cross
- Sodium
- Carbon Dioxide
- Albumin
- Lipase
- Amylase
- Cardiac enzymes
- TSH
- CT scan
- Urine Analysis
- Urine C&S
- HgA1C
- Anion gap
- Calcium
- Magnesium
- ultrasonography
- Pulse Oximetry
- Ferritin
- DDimer
- Therapeutic drug Levels
- hCG
- MSK X-ray/MRI
- Rheumatoid factor
- Cholesterol Panel
- Wound C&S
- BNP
- Blood C&S
- ABGs
- PT, PTT, INR
- Toxicology screens

**AQUIFER CASES**

1. Family Med 27: 17 year old male with groin pain
2. Internal Med 1: 49 year old man with chest pain
3. Internal Med 4: 67 year old woman with shortness of breath and lower leg swelling
4. Internal Med 7: 28 year old woman with lightheadedness
5. Internal Med 22: 71 year old man with cough and fatigue
6. Internal Med 30: 55 year old woman with leg pain

See Appendix E for suggestions of additional cases to complete.

**END OF EMERGENCY MEDICINE LEARNING OBJECTIVES**