

DESCRIPTIONS FOR MED 3 ROTATIONS

Critical Care A2 – ICU

A. Neurological

1. Delirium

- Discuss the differential diagnosis and appropriate investigation for delirium.
- Provide non-pharmacological and pharmacological treatment options for delirium.

2. Sedation

- Know the goals of sedation and complications associated with excessive sedation in the critically ill patients.
- Discuss the pros and cons of the medications used including narcotics, benzodiazepines, propofol and ketamine.
- Have knowledge of propofol syndrome.
- Discuss the role of sedation scales such as the RASS and Ramsey scale.

3. Paralysis

- List indications for paralysis of the critically ill patient.
- Discuss the differences between depolarizing and non-depolarizing agents.
- List complications of paralytic agents.
- Discuss clinical features of malignant hyperthermia and how it is managed.
- Discuss the clinical presentation, risk factors for, diagnosis and treatment of critical illness polyneuropathy.

4. Status Epilepticus

- Know the definition and potential etiologies of a patient in status.
- Discuss appropriate investigations and the principles of management for the patient.
- Know which sedative medications have antiseizure properties.

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5. Myasthenia Gravis and Guillain-Barre

- Know the pathophysiology, clinical signs and symptoms underlying each disorder.
- Discuss how a patient can be followed for impending respiratory failure.
- Discuss the diagnosis and treatment.

6. Hypoxic Brain Injury

- Discuss the indications for cooling a patient after cardiac arrest.
- Have an understanding of which physical exam findings are predictive of neurological recovery after hypoxic brain injury.
- Have an understanding of the decision making process and steps involved in withdrawal of life support.

7. Organ Donation

- Have an understanding of the criteria for diagnosis of brain death and who can be a potential organ donor.
- Have a basic understanding on the guidelines for management of the organ donor.

8. Neurosurgical Issues

- Know how to calculate CPP and the normal CPP range.
- Discuss the management principles for raised ICP.
- Discuss the issues for prevention of secondary injury in SAH including control of temperature, glucose control, prevention and treatment of vasospasm with nimodipine and HHH therapy.
- Know how to work up and treat different Na disorders including SIADH, cerebral salt wasting and DI.

B. Cardiovascular

1. Shock and blood pressure support

- What are the different classes of shock and give examples of each.
- Discuss how to investigate and the management principles behind each of the causes of shock.
- Know the different crystalloids and colloids available for resuscitation.
- Have knowledge of the mechanism of action of commonly used vasopressors and inotropes, including dopamine, dobutamine, milnerone, levophed, phenylephrine, epinephrine, vasopressin.
- Discuss adverse events associated with the above agents.

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2. Acute Coronary Syndromes

- Discuss the principles of management of unstable angina, NQMI and STEMI. How does this change if the patient is post-op?
- Discuss the concerns specific to an acute anterior MI, Inferior MI.
- Demonstrate knowledge of complications during the first week post-MI.
- Discuss the risks for peri-operative MI and how to minimize these risks.
- List other conditions that may present with an elevated troponin in the critically ill.

3. Arrhythmias

- Discuss possible etiologies and the approach to management of atrial fibrillation.
- Discuss the possible etiologies and management of tachycardia. Know the indications for cardioversion.
- Discuss the possible etiologies and management of bradycardia.

4. Invasive Monitoring

- Discuss indications for central line placement.
- Have knowledge of the sites for central venous and arterial access, the pros/cons associated with the different sites and complications associated with central line placement.

5. Successfully execute the different ACLS algorithms.

6. Interpretation of EKGs

C. Respiratory

1. Airway Management

- Know indications for intubation.
- Have knowledge of what equipment, personnel, and medications are required before proceeding with intubation.
- Discuss how to assess for a potential difficult airway and describe backup plans for an unexpected difficult airway.

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2. Ventilation

- Describe the indications and contraindications for non-invasive mechanical ventilation.
- Describe the indications for invasive mechanical ventilation.
- Become familiar with the different modes of invasive ventilation, including volume control, pressure control and pressure support.
- Know how to order ventilator parameters including tidal volume, RR, FiO₂, peep and understand how to make appropriate changes in the ventilator based on blood gases.
- List factors that indicate a patient may be ready for extubation.

3. Pneumonia

- Discuss the microbiology of community-acquired pneumonia and the treatment guidelines.
- Have knowledge of the definition, microbiology, preventative measures and empiric antibiotic choices for ventilator-associated pneumonia.
- When and with what should aspiration pneumonia be treated? Discuss the typical CXR pattern.

4. COPD and Asthma

- List important history and physical exam findings for a patient presenting with an asthma exacerbation. Discuss features suggesting impending respiratory failure.
- Discuss the management of status asthmaticus.
- Discuss the treatment of a severe COPD exacerbation.
- Have knowledge of important factors to consider when writing ventilator orders in a patient with severe obstruction due to either asthma or COPD.
- Discuss the role of non-invasive ventilation after extubation of a patient with severe COPD.

5. Pulmonary Embolism

- Discuss the risk factors and clinical exam findings suggestive of DVT/PE.
- Discuss the investigation, treatment and the role of thrombolytics for PE. What is the role for an IVC filter?
- Discuss the effectiveness of DVT prophylaxis. How is prophylaxis different for orthopedics and trauma patients?

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6. ARDS

- Define ARDS and ALI.
- Have knowledge of the pathophysiology, etiology and management of ARDS. This should include an understanding of ventilation techniques, as well as other methods to manage severe hypoxia including sedation, paralysis, diuresis and inverse ratio ventilation.
- Recognize the clinical presentation and know the management of life threatening respiratory problems in the intubated patient including pneumothorax, blocked ETT, accidental extubation.

7. Technical Skills

- Bag-mask ventilation
- Interpretation of a CXR including recognition of a pneumothorax and deep sulcus sign, pleural effusions in the supine patient, CHF, airspace disease, ARDS, correct placement of central lines, pulmonary artery catheters, endotracheal tube, NG tubes, and chest tubes

D. Gastroenterology

1. Nutrition

- Be familiar with recommendations for nutrition of the critically ill patient.
- Have knowledge of options for different enteral formulations available for specific patient populations, including diabetics and renal failure patients.
- Discuss the options if the patient doesn't tolerate gastric feeding.
- What are the indications for TPN and list the risks associated with it.

2. Pancreatitis

- Discuss the etiology, management, and feeding recommendations for severe acute pancreatitis.
- Discuss the management of the complications of pancreatitis including ARDS, necrosis, infection, hemorrhage, and abdominal compartment syndrome.

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3. GI bleeding

- Discuss the common etiologies of upper vs lower GI bleeding and how the two presentations differ.
- Discuss the management principles for upper GI bleeding and severe lower GI bleeding.
- Have knowledge of the role for gut prophylaxis in the ICU.

4. Liver failure

- List the common etiologies for acute and chronic liver failure.
- Discuss the management principles for the complications of acute liver failure including cerebral edema, encephalopathy, hypoglycemia and coagulopathy.
- Discuss the causes of acute decompensation in patients with chronic liver failure, including ascites, spontaneous bacterial peritonitis, encephalopathy, portal hypertension, variceal bleeding, and hepatorenal syndrome. Know the management of each problem.
- Discuss complications and management of the post-op liver transplant patient including acute rejection, hepatic artery thrombosis, biliary leak and renal failure.

E. Genitourinary

1. Renal failure

- Discuss an approach and work up for ARF, including pre-renal, renal and post-renal causes of ARF.
- List the indications for acute dialysis.
- Discuss the potential benefits of CRRT or SLEDD in the critically ill patient.
- Discuss the risks, indications for treatment and the management of rhabdomyolysis.

2. Acid-base and electrolytes

- Demonstrate the ability to interpret blood gases.
- Discuss the differential of an anion gap and non anion gap metabolic acidosis.
- Discuss the approach to the diagnosis and management of hyper/hyponatremia.

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F. Hematology

1. Thrombocytopenia

- Describe the differential diagnosis and workup for thrombocytopenia.
- Discuss the pathophysiology, factors supportive of a diagnosis and the management of a patient with suspected HIT.

2. Transfusions

- Discuss the TRICC trial and transfusion triggers in the ICU patient.
- Discuss potential transfusion reactions and how they are managed.
- What is the definition of massive transfusion? Discuss the immediate and long term complications of massive transfusions.

G. Endocrinology

- Discuss recognition, diagnosis and treatment of relative adrenal insufficiency in the critical ill population.
- Discuss the evidence for tight glycemic control in the intensive care unit.
- What are the causes of DKA? Discuss diagnoses and management of a patient with DKA.
- Discuss the presentation and management of a patient with thyroid storm or myxedema coma.

H. Infectious Disease

1. Sepsis

- Define SIRS, sepsis, severe sepsis and septic shock.
- Discuss early goal directed therapy of septic patients. What is the significance of central venous gases?
- Discuss other treatments for sepsis including timely broad-spectrum antibiotics, source control, steroids and activated protein C.

2. Infection

- Identify potential sources of infection in the ICU, including CNS, sinusitis, lines, skin, CAP, VAP, intra-abdominal abscess, acalculus cholecystitis, biliary obstruction, urine and c.diff colitis
- Discuss potential organisms responsible for each source and appropriate empiric antibiotic choices.

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I. Toxicology

- Discuss findings of sympathomimetic, anti-cholinergic, cholinergic and narcotic toxidromes.
- Discuss the essential investigations of a potential drug overdose.
- Demonstrate the ability to calculate an anion gap, serum osmolality and osmolar gap. What is the significance of an elevated AG or osmolar gap?
- Discuss the presentation and management of common overdoses including:
 - Toxic Alcohols
 - ASA
 - Tylenol
 - TCAs
 - Neuroleptic Malignant Syndrome and Serotonin syndrome
- Which overdoses require nephrology consults for consideration of dialysis?

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