



HUMANITAS MEDICAL SCHOOL

Course: EMERGENCIES

Year (1st-2nd-3rd-4th-5th-6th): 6th

Period (1st-2nd semester – annual): 1st semester

Credits: 4

OBJECTIVES

The course "Emergencies" focuses on recognizing and initially managing patients with acute critical diseases. The core of the course is the Airway, Breathing, Circulation, Disability, and Exposure (A-B-C-D-E) approach to assess and treat these patients.

The key learning outcomes of the course are:

- Identifying patients with one or more acute vital organ dysfunctions.
- Recognizing the underlying disease through clinical examination, blood tests, and other instrumental examinations.
- Initiating appropriate therapy.
- Understanding when to seek assistance from other medical specialists.

PREREQUISITES

To attend the exam, students must have passed these other exams:

- BIostatISTICS
- SYSTEM DISEASES 1, 2 AND 3
- CLINICAL IMMUNOLOGY AND DERMATOLOGY
- INFECTIOUS DISEASES
- BONE AND JOINT DISEASES
- CLINICAL NEUROSCIENCE
- PATHOLOGY
- NEUROPHARMACOLOGY
- ONCOLOGY

CONTENTS

Lecture 1. How to recognize a critically ill patient

Learning objectives

- To describe the physical and clinical signs that should be assessed in a critically ill patient
- To describe the clinical scores useful to identify a critically ill patient, including the National Early Warning Score (NEWS)
- To describe the basic principles of initial management and treatment of a critically ill patient

Lecture 2. Shock: definition and different forms

Learning objectives

- To define shock and address its pathophysiology
- To describe the main determinants of the whole-body oxygen delivery
- To distinguish between different forms of shock: hypovolemic, cardiogenic, obstructive, distributive
- To describe the physical and clinical signs that should be assessed in a patient with shock
- To describe the basic principles of the initial management of a patient with shock

Lecture 3. Acute respiratory failure (part 1)

Learning objectives

- To define and recognize a patient with acute respiratory failure
- To describe the physical and clinical signs that should be assessed in a patient with acute respiratory failure
- To describe the most common causes of acute respiratory failure

Lecture 4. Sepsis: definition and pathophysiology

Learning objectives

- To define sepsis and septic shock
- To describe the physical and clinical signs that should be assessed in a patient with sepsis or septic shock
- To describe the basic principles of initial therapy

Lecture 5. Sepsis: microbiological diagnosis and antimicrobial therapy

Learning objectives

- To describe the initial microbiological investigations that should be ordered in a patient with sepsis or septic shock
- To describe the basic principles of antimicrobial therapy in a patient with sepsis or septic shock

Lecture 6. Cardiac arrest

Learning objectives

- To define and recognize cardiac arrest
- To describe the most common causes of cardiac arrest
- Shockable versus non-shockable rhythms
- To emphasize the importance of high-quality cardiopulmonary resuscitation and early defibrillation
- Post-cardiac arrest: search for a reversible cause of the cardiac arrest and protect the brain

Lecture 7. Acute coronary syndromes

Learning objectives

- To describe the physical and clinical signs that should be assessed in a patient with an acute coronary syndrome
- To discriminate between angina pectoris, N-STEMI, and STEMI
- Initial diagnostic tests and drugs for patients with acute coronary syndrome
- Fibrinolysis versus PCI

Lecture 8. Hypertensive crisis

Learning objectives

- To define and recognize a hypertensive crisis
- Differential diagnosis
- Basic principles of the initial therapy
- Side effects of the most commonly used anti-hypertensive drugs

Lecture 9. Initial evaluation of a trauma patient

Learning objectives

- To learn a standardized approach to a patient with multiple injuries based on a proper sequence of priorities: the primary and secondary surveys

Lecture 10. Traumatic brain injury

Learning objectives

- Basic physiology of intracranial pressure and hypertension
- Initial assessment of patients with a head injury

- Mild, moderate, and severe head injuries
- To explain the importance of limiting secondary brain injury

Lecture 11. Damage control resuscitation

Learning objectives

- Traumatic coagulopathy
- Coagulation tests
- Massive transfusion protocol

Lecture 12. Damage control surgery

Learning objectives

- Controlling major hemorrhage
- Containing contamination
- Applying temporary closure devices
- Returning to the operating room for re-exploration or definitive repair and closure

Lecture 13. Clinical cases of trauma patients

Learning objectives

- Simulated cases on how to approach a trauma patient

Lecture 14. Acute kidney injury

Learning objectives

- To recognize and classify the stages of AKI based on laboratory parameters, etiology, and clinical presentation.
- To develop a systematic approach for evaluating and managing patients with severe AKI and its complications (such as hyperkalemia, metabolic acidosis, and fluid overload).
- To understand the indications and steps for initiating renal replacement therapy in AKI cases.

Lecture 15. Climate changes and related diseases

Learning objectives

- To become aware of the short and long-term effects of both acute and slow changes in environmental temperature on human health: general concepts and focus on heat stroke, syncope, and cognitive performances.
- To evaluate the role of absolute temperature changes versus the magnitude of daily temperature variability in promoting loss of consciousness. Focus on the methodology to be used

- To assess human cognitive modifications during acute exposure to high and low classroom temperatures during lectures
- To understand the definition, etiology, and pathophysiology of heat stroke
- To know and apply the emergency treatment of heat stroke

Lecture 16. Acute respiratory failure (part 2)

Learning objectives

- Drug therapy
- Oxygen therapy
- Ventilatory support

Lecture 17. Initial approach to the comatose patient

Learning objectives

- Definition of coma
- The Glasgow Coma Scale
- How to evaluate the pupils?
- Diagnostic approach and differential diagnosis
- Principles of treatment of the comatose patient

Lecture 18. Acute liver failure

Learning objectives

- To define and recognize Acute Liver Failure and Acute-on-chronic liver failure
- To describe the most common causes of Acute Liver Failure, grades, and mortality
- Critical care management strategies
- To emphasize the importance of early identification of liver transplant candidates

Lecture 19. Fluid resuscitation: basic principles

Learning objectives

- Why do we prescribe fluids?
- Fluid responsiveness
- Venous and intraosseous access
- Which fluid?
- Fluid challenge

Lecture 20. Toxicology: drug abuse

Learning objectives

To describe the most commonly abused drugs and their major clinical effects

- Opiates (chronic addiction, overdose syndrome, abstinence syndrome)
- Cocaine (acute and chronic intoxication)
- Marijuana and cannabis compounds (acute and chronic intoxication)
- Lysergic acid diethylamide or LSD (the “bad trip”)
- Abuse of more than one drug
- Pharmacological and non-pharmacological treatment of drug abuse

Lecture 21. Burns

Learning objectives

- To learn how to assess and classify burn wounds and estimate their size and depth
- To learn how to predict morbidity and mortality of burn wounds
- The stress response to acute burn injuries
- Initial management of patients with acute burn injuries
- Initial management of burn wounds: normal healing, wound infection, topical and antimicrobial agents, biological dressings, skin substitutes, and grafts, wound debridement, release of scar contracture
- Burn rehabilitation
- Special situations: inhalation injuries, chemical burns, electrical injuries, and toxic epidermal necrolysis

Lecture 22. Wound care

Learning objectives

- To identify the three phases of wound healing
- To summarize the steps in caring for an acute wound
- To describe the proper way to clean a wound
- To discuss the various ways to close an acute wound
- Signs and symptoms of an infected wound
- Causes and principles of care for chronic wounds

Lecture 23. Simulated cases for the exam

Learning objectives

- To test your ability to use the A-B-C-D-E approach and address questions and doubts

TEACHING METHODS



Interactive lectures, discussion of clinical cases, and simulated cases led by the teachers.

ASSESSMENT

Students' competencies will be assessed through an oral discussion of clinical cases. The A-B-C-D-E approach will be the primary focus for the student's final evaluation. Students' general knowledge of appropriate diagnosis and therapy will also be evaluated.

TEXTS

- All the material provided by the teachers, including their presentations and references
- UpToDate: Evidence-Based Clinical Decision Support resource (uptodate.com)
- Critical Care Physiology. Bartlett RH, University of Michigan Press, 2000.
- The ICU survival book. Owens W, First Draught Press, 2022.