



MEDICINE AND SURGERY

Course: **EMERGENCIES**

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

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

Credits: 4

OBJECTIVES

The Emergency course is focused on the initial management of patients presenting to the Emergency Department with an acute critical disease.

Most important learning outcomes

- To identify patients with one or more acute vital organ dysfunctions
- To recognize the underlying disease based on the clinical examination, blood tests, and other instrumental examinations
- To start an appropriate therapy
- To understand when to seek assistance from other medical specialists

PREREQUISITES

To attend the exam of Emergencies, 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. The critically ill patient

Learning objectives

- When is a patient critically ill?
- To describe the most common causes of acute vital organ dysfunction

Lecture 2. 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 3. 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 4. Acute respiratory failure

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
- Drug therapy
- Ventilatory support

Lecture 5. 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 an acute coronary syndrome
- Fibrinolysis versus PCI

Lecture 6. Sepsis and septic shock: definition and recognition

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 7. Sepsis and septic shock: 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 8. How to interpret an arterial blood gas analysis?

Learning objectives

- To learn the basic principles and applications of the Stewart approach to the interpretation of the arterial blood gas analysis

Lecture 9. How to interpret a venous blood gas analysis?

Learning objectives

- What information can be obtained from a peripheral venous blood gas analysis?
- Central venous blood gas analysis: central venous oxygen saturation and central venous-to-arterial carbon dioxide gap

Lecture 10. Arrhythmias in the emergency setting

Learning objectives

- To describe the physical and clinical signs that should be assessed in a patient with a malignant arrhythmia
- To consider differential diagnoses based on ECG findings
- To plan an appropriate and suitable treatment
- Drugs versus electrical defibrillation
- To define the most reasonable therapy based on whether the arrhythmia causes hemodynamic instability or not

Lecture 11. 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 12. Traumatic brain injury

Learning objectives

- Basic physiology of intracranial pressure
- Basic pathophysiology of intracranial 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 13. Fluid resuscitation: basic principles

Learning objectives

- Why do we prescribe fluids?
- Fluid responsiveness

- Venous and intraosseous access
- Which fluid?
- Fluid challenge

Lecture 14. Haemorrhagic shock: haemostatic resuscitation

Learning objectives

- Traumatic coagulopathy
- Coagulation tests
- Massive transfusion protocol

Lecture 15. Haemorrhagic shock: damage control resuscitation

Learning objectives

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

Lecture 16. 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 17. Simulated cases: the surgical critically ill patient

Learning objectives

- How to approach a patient with multiple trauma?
- How to approach a patient with gastrointestinal bleeding?
- How to approach a patient with bowel obstruction?

Lecture 18. 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 19. Effects of changes in environmental temperature on human health

Learning objectives

- To get awareness of the short and long term effects of both acute and slow changes in environmental temperature on human health: general concepts and focus on the heat stroke, syncope and cognitive performances
- To understand the definition, aetiology and pathophysiology of heat stroke
- To know and apply the emergency treatment of heat stroke

- 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's cognitive modifications during acute exposure to high and low classroom temperatures during lectures

Lecture 20. 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 21. 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 22. Simulated cases: sepsis and septic shock

Learning objectives

- How to approach a patient with sepsis or septic shock?

Lecture 23. Simulated cases to be produced by the students: shock

Learning objectives

- To produce a clinical case on shock according to teacher instruction
- To present the clinical case to the class
- General discussion of the clinical case

Lecture 24. Burn

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, scar contracture release
- Burn rehabilitation
- Special situations: inhalation injuries, chemical burns, electrical injuries, and toxic epidermal necrolysis

Lecture 25. 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

TEACHING METHODS

Interactive lectures, discussion of clinical cases, simulated cases led by the teachers or the students

ASSESSMENT

Students' fulfilment of competencies will be assessed with an oral discussion of clinical cases. The major issue for the student's final evaluation will be the patient's clinical approach methodology according to the A-B-C-D-E approach. General knowledge of diagnosis and therapy for each disease is also required.

TEXTS

- All the material provided by the teachers, including their presentations and references
- Harrison's: Principles of Internal Medicine (McGraw Hill)
- UP-To-Date: Evidence Based Clinical Decision Support resource
- Sabiston: Textbook of Surgery (Elsevier)
- Bartlett: Critical Care Physiology (Scholarly Publishing Office, University of Michigan Library)
- Singer&Webb: Oxford Handbook of Critical Care (Oxford Medical Handbooks)