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 will provide the students with conceptual tools to properly manage *major clinical presenting problems* in the Emergency Department. For each presenting problem the diagnostic and therapeutic aspects will be addressed

General Learning Outcomes

- Achievement of the basics of clinical judgment in the evaluation of patients with any of the presenting problems in the emergency setting
- To know the diseases associated with any of the presenting problems
- Management of complex differential diagnoses by the appropriate use of clinical, laboratory tests and exams findings
- Set up of a proper patient's treatment according to the hypothesized diagnosis

Prerequisites

To be allowed to the Patient management exam students must have passed the exams of:

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 the critical ill patient based on recorded parameters***

Learning objectives

- Identify the critically ill patient
- Describe the pathophysiological mechanisms leading to unstable metabolic, respiratory and cardiovascular conditions
- Recognize the changes in the physiological variables to identify unstable clinical conditions
- Clinical scores
- Management and treatment of the critically ill patient

Lecture 2a. ***The critical ill patient***

Learning objectives

- Define the critically ill patient
- Describe the pathophysiological mechanisms leading to unstable metabolic, respiratory and cardiovascular conditions
- Describe the physiological variables and physical signs suitable to potentially identify unstable clinical conditions
- Clinical scores and the National Early Warning Score (NEWS)
- Management and treatment of the critically ill patient

Lecture 2b. ***How to recognize the critically iII patient based on recorded parameters***

Learning objectives

- Identify the hemodynamic, metabolic and respiratory parameters assessing the critically ill patient
- Describe the pathophysiological mechanisms underlying parameters changes
- Management and treatment based on the recorded parameters

Lecture 3. ***Arrhythmias in the emergency setting***

Learning objectives

- Describe the presenting clinical and physical signs of patients suffering from malignant arrhythmias
- Consider differential diagnoses based on ECG findings
- Plan appropriate and suitable treatment
- Drugs versus electrical defibrillation

- arrhythmias and haemodynamic instability
- Define the likely most effective therapeutic options according to the patient's clinical condition

Lecture 4. ***Coronary acute syndromes***

Learning objectives

- Describe the presenting clinical and physical signs of patients suffering from coronary acute syndromes
- The differential diagnoses of acute coronary syndromes: angina pectoris, NSTEMI and STEMI
- The ECG in angina pectoris, STEMI and NSTEMI
- Plan appropriate diagnostic tests and suitable drug treatment of acute coronary syndromes
- Fibrinolysis versus PCI strategy

Lecture 5. ***Cardiac arrest***

Learning objectives

- Definition and diagnosis of cardiac arrest
- Mechanisms underlying cardiac arrest
- Initial evaluation (shockable *vs*. non-shockable rhythm)
- High-quality cardiopulmonary resuscitation and early defibrillation
- Post-cardiac arrest: search for a reversible cause and protect the brain
- Prognosis

Lecture 6. ***Acute Respiratory Failure (part 1)***

Learning objectives

- Definition and diagnosis of acute respiratory failure
- "Pump" failure *vs*. "lung" failure
- Abnormalities in the ventilation-to-perfusion ratio: from shunt to dead space
- Starling forces and the pathophysiology of pulmonary oedema
- Therapeutic implications of the mechanism underlying the acute respiratory failure: supplemental oxygen *vs*. positive pressure ventilation

Lecture 7. ***Acute respiratory failure (part 2)***
Learning objectives

- Definition and diagnosis of acute respiratory failure
- Describe the clinical features of a patient with acute respiratory failure
- Major causes of acute respiratory failure
- Drug therapy
- Non-pharmachological approach to acute respiratory failure

Lecture 8. ***Acute chemical and physical injuries***

Learning objectives:

- Define and list the most common GI injuries induced by chemicals and physicals
- Upper GI Injury from caustics
- Short and long term aftereffects of injuries
- Therapeutic options

Lecture 9. ***Shock (part 1)***

Learning objectives:

- Define shock and address its underlying pathophysiological mechanisms
- Describe the clinical features of a patient suffering from a shock
- Identify different types of shock (distributive, cardiogenic, hypovolemic, obstructive)
- Focus on septic shock

Lecture 10. ***Shock (part 2)***

Learning objectives

- Etiologic therapy (treat the underlying disease)
- Supportive therapy (restore perfusion)

Lecture 11. ***Shock Clinical Cases to be produced by students***
Learning objectives

- Produce a Clinical case of Shock according to teacher instruction
- Present the Clinical Case to the class
- General discussion of the clinical case

Lecture 12. ***Drug abuse***

Learning objectives

- Identify the most commonly abused drugs and describe their major clinical effects:

- Opiate (chronic addiction, overdose syndrome, abstinence syndrome)
- Cocaine (acute and chronic intoxication)
- Marijuna and Cannabis compounds (acute and chronic intoxication)
- Lysergic acid diethylamide -LSD (the bad trip)
- Miscellanea
- Polydrug abuse
- Abused drugs pharmachological and non-pharmachological treatment
- The role of the anaesthesiologist

Lecture 13. ***Trauma Surgery (Part 1 – Head, Neck and extremities)***

Learning objectives

- Identify the correct sequence of priorities for assessment of a multiply injured patient and apply the principles outlined in the primary and secondary surveys to the assessment of a multiply injured patient.
- Explain how a patient's medical history and the mechanism of injury contribute to the identification of injuries.
- Describe basic intracranial physiology.
- Evaluate and classify head injury patients based on severity.
- Explain the importance of adequate resuscitation in limiting secondary brain injury
- Describe the basic anatomy and physiology of cervical spine. Evaluate and appropriately treat a patient with suspected spinal injury.
- Identify the common types of spinal injuries and their x-ray features.
- Explain the significance of musculoskeletal in patients with multiple injuries.
- Identify life- and limb-threatening injuries and explain the initial management of musculoskeletal injuries.

Lecture N. 14 ***Trauma Surgery (Part 2 – Head, Neck and extremities; endpoint of intensive care after trauma*****)**

Learning objectives

- Identify and initiate treatment during the primary survey of injuries that affect the airway.
- Identify and initiate treatment during the secondary survey of the eight potentially life-threatening injuries.
- Describe the significance and treatment of subcutaneous emphysema, thoracic crush injuries, and sternal, rib, and clavicular fractures.
- Identify the key anatomic regions of the abdomen and recognize a patient at risk for abdominal and pelvic injuries based on the mechanism of injury.

- Apply the appropriate diagnostic procedures and identify patients who require surgical consultation.
- Describe the acute management of abdominal and pelvic injuries
- Explain that endpoints of posttraumatic resuscitation are useful for stratifying the patients' severity of physiologic derangement and are essential to predict development of MODS or death.
- Describe the adequate endpoints of resuscitation improve patient survival and morbidity (organ system dysfunction).

Lecture 15. ***Intensive care after Trauma, Resuscitation following major trauma***

Learning objectives

- Golden hour
- Recognition of shock after trauma
- Most common causes of shock after trauma
- Principles of resuscitation: targets and drugs
- Traumatic coagulopathy: diagnosis and treatment
- Massive transfusion

Lecture 16. ***Drugs and procedures used by the anaesthesiologist in the Emergency Room***

Learning objectives

- Identify and describe physiological and major side effects of the commonly used drugs in the ED.
- Describe clinical and adverse side effects of the device-based procedures used in the emergency room.

Lecture 17. Hypovolemic ***Shock Clinical Cases to be produced by students***

Learning objectives

- **Produce a Clinical case of Shock according to teacher instruction**
- **Present the Clinical Case to the class**
- **General discussion of the clinical case**

Lecture 18. ***Burn***

Learning objectives

- Learn assessment and classification of burn wounds, including estimation of burn size and depth and prediction of related morbidity and mortality.
- Gain appreciation of stress response to acute burn injuries, including hemodynamic, metabolic, nutritional support, wound care and ventilator management.
- Learn initial management of the acute burn patient, including fluid resuscitation, nutritional support, wound care and ventilator management.
- Learn wound management of burn patients, including an understanding of wound healing, wound sepsis, topical and antimicrobial agents, biological dressings and skin substitute and skin grafts.
- Develop fundamental surgical skills in treatment of burn patients, including wound debridement, wound dressing and splinting, skin grafting and scar contracture release.
- Gain appreciation for burn rehabilitation, including physical and occupational therapy, psychosocial support and reconstructive needs.
- Learn principles of management of special problems, including inhalation injuries, chemical burns, electrical injuries and toxic epidermal necrolysis.

Lecture 19. ***Wound care***

Learning objectives

- Identify the three phases in the healing of skin wounds.
- Summarize the steps in caring for an acute wound.
- Describe the proper way to cleanse a wound.
- Discuss the various ways to close an acute wound.
- Name the signs and symptoms of an infected wound.
- Identify the principles underlying the care of chronic wounds.
- Identify the principles causes of a chronic wound.
- Learn wound management using wound bed preparation principles and know the most common debridement method and dressings.

Lecture 20. ***Hypertension: hypertensive crisis identification and treatment***

Learning objectives

- Identify hypertensive crisis.
- Differential diagnosis.
- Plan an appropriate therapy.
- Side effects of the most used drugs.

Lecture 21. ***Interpretation of the blood gas analysis***

Learning objectives

- Identify the most common simple and mixed acid-base abnormalities
- Describe the most common diseases underlying those same acid-base abnormalities
- Arterial *vs*. venous blood gas analysis

Lecture 22. *Coma*

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

Teaching Methods

Interactive Lectures, Discussion of Clinical Cases

Verification of learning

Students' fulfilment of competencies will be assessed by:

- an *interview based on discussion of clinical cases* (oral part). The methodology of patient's clinical approach will be the major issue for the student's final evaluation. General aspects of therapy for each of the diseases are also required.
- a semi-quantitative assessment of the *core curriculum* addressing its completeness will finalize the student's final evaluation

Texts

Harrison's - Principles of Internal Medicine

UP To Date – Evidence Based Clinical Decision Support resource

Sabiston - Textbook of Surgery (Elsevier)

Hall, Schmidt and Kress "Principles of critical care".