



MEDTEC SCHOOL

Course: Organ System Diseases III: Endocrine and Gastrointestinal systems, Nutrition and Metabolism

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

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

Credits: 4

Objectives

The course consists of two modules (Gastroenterology and Endocrinology, both integrating Surgery) that will be associated with technologies applied in the respective clinical fields.

GASTROENTEROLOGY MODULE

LEARNING GOALS

Knowledge and understanding:

By the end of the Course, students must have knowledge and understanding skills to be able to describe and correlate the physiopathological aspects as well as the clinical manifestations and consequences of the main gastroenterological diseases. The main technology involved in the diagnosis and treatment of such disorders will be explored in dedicated laboratories and with the support of simulators.

In particular,

1. They will know the structure and normal functioning of the GI Tract, including liver, pancreas and biliary tract.
2. They will have understood the epidemiology and risk factors for gastroenterological diseases
3. They will know the pathophysiological aspects that characterize the main gastroenterological diseases
4. They will know the systemic consequences of gastroenterological diseases
5. They will know the principles of technologies applied for diagnosis and treatment of gastroenterological diseases, such as artificial intelligence, electrosurgical generators, robotic surgery, endoscopy, elastography, and diagnostic imaging

Application of knowledge and understanding:

At the end of the course, students must be able to apply their knowledge to understanding and solving individual health problems related to gastroenterological diseases by integrating them with existing technologies for diagnosis and cure

In particular,

1. They will be able to describe and interpret the signs and symptoms related to gastroenterological disease
2. They will be able to identify the most appropriate laboratory and instrumental exams for the diagnosis of gastroenterological diseases



3. They will be able to interpret the laboratory data necessary for the diagnosis and differential diagnosis of gastroenterological diseases
4. They will be able to interpret the results of Radiology, pathology and endoscopy in the diagnosis of gastroenterological diseases
5. They will be able to understand how the main technologies applied to gastroenterological diseases work and the expected outcomes

ENDOCRINOLOGY MODULE

Objectives

LEARNING

GOALS

Knowledge and understanding:
By the end of the Course, students are expected to have knowledge and understanding skills to be able to describe and correlate the pathophysiological aspects as well as the clinical manifestation and consequences of the main endocrine-metabolic diseases. Moreover, therapies of endocrine-metabolic diseases are expected to be known by the students by the end of the Course. The students of MEDTEC are also expected to know the main innovative technologies that are currently applied in the Endocrinology field

- In particular,
1. They will know the pathophysiological aspects characterizing the main metabolic endocrine pathologies.
 2. They will know the clinical presentation and systemic consequences of endocrine-metabolic alterations
 3. They will know the diagnostic tests of endocrine-metabolic diseases
 4. They will know the principles of therapies of endocrine-metabolic diseases

Application of knowledge and understanding:
At the end of the course, students must be able to apply their knowledge to understand and solve individual health problems related to endocrine-metabolic diseases

- In particular,
1. They will be able to interpret the signs and symptoms related to endocrine-metabolic diseases
 2. They will be able to define the diagnostic work-up of endocrine-metabolic diseases
 3. They will be able to interpret the exams performed for the differential diagnosis of endocrine-metabolic diseases
 4. They will be able to define the therapeutic work-up of endocrine-metabolic diseases
 5. They will be able to know the emerging technologies used for diagnosis and treatment of endocrine-metabolic diseases

Prerequisites achieved during the second year of MEDTEC
Knowledge of principles of physiology and anatomy of the endocrine system
Knowledge of principles of biochemistry of hormones

Contents

Module Gastroenterology

Esophagus

- Signs and symptoms of Esophageal disease
- Benign esophageal diseases
- Motor Disorders of the Esophagus
- Gastroesophageal Reflux Disease
- Eosinophilic Esophagitis and other rare esophagitis
- Neoplasia of the esophagus
- Medical and surgical management of esophageal diseases
- Technology: Peroral endoscopic myotomy, ph-metry, mano-metry, stent, radiological imaging

Stomach and Duodenum

- Signs and symptoms
- Helicobacter Pylori Infection & Gastritis and Peptic Ulcer Disease
- Upper GI Tumors
- Upper GI Bleeding
- Proton Pump Inhibitors: From Pharmacology to clinical indication
- Technology: endoscopic submucosal dissection, electrolyte study

Pancreas

- Pancreatic Secretion
- Acute & Chronic Pancreatitis
- Pancreatic Adenocarcinoma
- Cystic Neoplasms of the Pancreas
- Neuroendocrine Tumors of the Pancreas
- Technology: Endoscopic ultrasound

Biliary Tract

- Bile Secretion
- Gallstone Disease
- Autoimmune cholestatic liver diseases
- Tumors of the Biliary Tract
- Cholangioscopy, stenting

Liver

- From Anatomy to Liver function
- Natural History of liver disease
- Acute and Chronic Viral Hepatitis
- Genetic Liver diseases
- Autoimmune liver diseases
- Drug Induced Liver Injury



- Clinical Diagnosis and Complications of Liver Cirrhosis
- Hepato-Cellular Carcinoma: Diagnosis, staging and treatment
- Technology: elastography

Small and Large Intestine

- Epidemiology and genetic of Colorectal Cancer
- Screening for Colorectal Cancer
- Clinical Presentation and Endoscopic Management of CRC
- Surgical approach to colorectal neoplasia
- Polyposis syndrome of the GI tract
- Inflammatory bowel diseases
- Celiac Disease and Other Malabsorption Syndromes
- Diverticular Disease of the Colon
- Irritable Bowel Syndrome
- Intestinal Obstruction
- Disease of the Ano-Rectum
- Lower GI bleeding
- Technology: artificial intelligence, robotic surgery, transanal micro-surgery

Module Endocrinology

Pituitary diseases

Learning goals

- Describe the conditions of hypopituitarism: aetiology, clinical features and diagnostic testing
Knowledge of epidemiology of pituitary adenomas
- Identify the major clinical manifestations, chronic complications, diagnostic tests and therapies of Acromegaly, Nonfunctioning pituitary adenomas, Prolactin-secreting adenomas, Cushing's disease
- Describe the role of Endocrinologist, Radiotherapist, Neurosurgeon and Radiologist in the multidisciplinary approach to pituitary tumors
- Describe the clinical features and diagnostic testing of Diabetes insipidus
- Describe the clinical features and diagnostic testing of hyponatremia and SIADH
- Knowledge of innovative techniques for diagnosis and treatment of pituitary diseases

Hypothyroidism and thyrotoxicosis

Learning

goals

Knowledge of epidemiology, etiology, pathophysiology and classification of hypothyroidism and thyrotoxicosis

- Identify the major clinical manifestations and diagnostic testing related to hypothyroidism
- Identify the major clinical manifestations, diagnostic tests for differential diagnosis of thyrotoxicosis
- Knowledge of the role of imaging studies in the diagnostic workup of hypothyroidism and thyrotoxicosis (i.e. Thyroid scintiscan; Thyroid ultrasound)
- Identify the chronic complications of thyrotoxicosis
- Knowledge of therapies of hypothyroidism and thyrotoxicosis, with reference to innovative formulations for replacing hypothyroidism

Goiter, nodules and thyroid cancer

Learning goals

- Knowledge of epidemiology of thyroid nodules, and thyroid cancer (including medullary thyroid cancer)
- Knowledge of ultrasound and cytological classification of thyroid nodules
- Knowledge of diagnostic work-up, therapeutic work-up and follow-up of thyroid nodules and thyroid cancer
- Describe the role of Endocrinologist, Nuclear Medicine Specialist, Surgeon, Pathologist and Radiologist in the multidisciplinary approach to thyroid cancer
- Knowledge of the role of imaging studies in the diagnostic workup and treatment of patients with goiter, thyroid nodules and thyroid cancer, with reference to innovative technologies for differential diagnosis of thyroid nodules

Hyper- and hypoadrenalism

Learning goals

- Identify the major clinical manifestations and complications of hypercortisolism, hyperaldosteronism and pheochromocytoma
- Identify the causes, major clinical manifestations and complications of hypoadrenalism
- Knowledge of biochemical tests for diagnosis of hypoadrenalism, hypercortisolism, hyperaldosteronism and pheochromocytoma
- Knowledge of diagnostic work-up of adrenal incidentalomas
- Knowledge of therapies of hypoadrenalism, hypercortisolism, hyperaldosteronism and pheochromocytoma, with reference to the innovative formulations for treating hypoadrenalism

Hypercalcemia and Multiple Endocrine Neoplasia type 1 and 2 (MEN1 and 2)

Learning goals

- Knowledge of epidemiology, pathophysiology and classification of hypercalcemia
- Describe the causes and pathophysiology of PTH-independent hypocalcemia
- Identify the clinical presentation and complications of primary hyperparathyroidism
- Knowledge of diagnostic and therapeutic work-up of primary hyperparathyroidism
- Describe the clinical conditions included in MEN1 and MEN2 syndromes
- Knowledge of clinical approach to a patient with hypercalcemia
- Knowledge of multidisciplinary approach to a subject with gastro-intestinal NET

Hypocalcemia and Poliglandular autoimmune syndromes (PGAs)

Learning goals

- Knowledge of pathophysiology and classification of hypocalcemia
- Knowledge of epidemiology and causes of hypoparathyroidism
- Describe the causes of PTH-independent hypocalcemia
- Identify the clinical presentation and complications of hypoparathyroidism
- Describe the clinical conditions included in PGAs
- Knowledge of clinical approach to a patient with hypocalcemia

Osteoporosis

Learning goals

- Knowledge of epidemiology, pathophysiology and classification of osteoporosis
- Describe the causes of secondary osteoporosis

- Knowledge of the role of imaging studies in the diagnostic workup of osteoporosis with reference to innovative technologies for evaluating bone quality
- Describe the therapies of osteoporosis
- Knowledge of multidisciplinary approach to a subject with osteoporosis secondary to gastrointestinal disease

Female and Male Hypogonadism

Learning goals

- Describe the conditions of hypogonadism: aetiology, clinical features and diagnostic testing
- Describe the conditions of hirsutism in females: definition, aetiology, clinical features and diagnostic testing
- Describe the condition of menopause: definition, clinical features
- Describe the condition of male hypogonadism at different ages: aetiology, classification, clinical presentation, complications and diagnostic work-up
- Understand the principles underlying current therapeutic management, and the main goals of therapy in females and males hypogonadism

Diabetes, Dyslipidemia and Metabolic Syndrome

Learning goals

- Knowledge of epidemiology, causes, pathophysiology and classification of diabetes mellitus, dyslipidemia and metabolic syndrome
- Knowledge of acute and chronic complications of diabetes mellitus
- Knowledge of diagnostic work-up in subjects with diabetes mellitus

Knowledge the main drug classes used in Diabetes mellitus, obesity and Dyslipidemia treatment, with reference to innovative technologies used for insulin therapy and glucose monitoring

All lectures will be held synchronously, either in presence or using Teams. For the Pituitary Diseases, Thyroid Nodules and Cancer and Osteoporosis modules, a panel of teachers will be involved for multidisciplinary lectures. Moreover, for Hypercalcemia and MEN syndromes and Hypocalcemia and PGAs a collaborative activity for small/medium sized groups (e.g. Discussion of Clinical cases, Flipped Classrooms in the presence of a Panel of Discussants) will be organized.

Teaching Methods

All modules will be aimed at transferring knowledge to students by guiding them through the most relevant subjects of the disciplines included in the course. Students are expected to participate to lectures in a proactive manner and to take notes as part of the learning process. All lectures will be held synchronously, either in presence or using Teams.

Topics which embrace multiple specialists will be characterized by recorded lessons and collaborative activities for small/medium sized groups (e.g. Discussion of Clinical cases in the presence of a Panel of Discussants). These sessions will be an opportunity to clarify the doubts related to what is proposed in the asynchronous sessions.

Lectures: the main purpose of lectures is to transfer knowledge to students by guiding them through the most relevant subjects of the disciplines included in the course. Students are



expected to participate to lectures in a proactive manner and to take notes as part of the learning process.

Assessment

Written exam is based on a MCQ test divided into 3 blocks of 16 questions for Gastroenterology, Surgery and Endocrinology, respectively.

To pass the written exam, students must answer at least 24 questions, without scoring less than 8 question in any specific subject

Scores of the written exam will be based on the number of questions answered correctly as indicated in the table below. Students who pass the written exam will undergo an oral exam for Endocrinology, Surgery and Gastroenterology. Oral exam will add up to 3 points to the score of the written exam. A poor performance at the oral exam might determine a reduction of the overall mark or the failure of the exam. The final exam mark will be the average of the Endocrinology, Surgery and Gastroenterology marks. To obtain the “laude” students will need to score of correct answers at the written exam > 40/48 (>28/30) and perform an excellent oral exam.

Number of correct answers	Mark
>44/48	30/30
40-44/48	28/30
36-40/48	26/30
32-36/48	24/30
28-32/48	22/30
24-28/48	18/30

Texts

Unigastro- Digestive Diseases 2019-2022 – Editrice Gastroenterologica Italiana

Norton J. Greenberger, Gastroenterology Hepatology & Endoscopy – Current diagnosis & treatment
McGraw Hill

Greenspan's Basic and Clinical Endocrinology, Tenth Edition, Lange textbooks

Williams Textbook of Endocrinology (14th Edition) by Shlomo Melmed, Kenneth Polonsky, P. Reed Larsen,
Henry Kronenberg. Elsevier