UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Digestive Health

2526-5-H4102D043

Aims

The Vertical Tract of the Digestive system in an integrated course that includes the following modules:

- Normal and Pathologic Anatomy
- Physiology
- Pharmacology
- Diagnostics (Radiology)
- Surgery (liver, biliary tract and digestive ststem)
- Hepato-Gastroenterology
  this part of the tract is followed by the activities of the Clerkship 9 (see Syllabus dedicated to Clerkship 9)

**the aims of acrtive learning refer specifiucally to:

1. knowledge and comprehension (what the student knows at the end of the course);
2. ability to apply knowlwdge and comprehension (“what the student is able to do at the end of the course, that is to say which are the acquired skills).
   moreover, the course aims to allow the development of "transversal skills" (soft skills), through multidisciplinary interasctions between different scientific sectors:

- critical and judgment skills (laboratory , MD groups, interactive classes, MC questions preparation);
- comunication skills of what has been learned (PBL sessions, interactive sessions);
- capabiliuty of pusuing study skills after the end of the course (authonomous study, lesson preparation in the context of the "flipped classroom principles)

To follow the details of each module

Anatomy of the Digestive Tract
Aims: acquiring an in-depth knowledge of gastrointestinal system viscera, with a focus also on: vascularisation, lymphatic drainage, relationship with peritoneum/ligaments; revision of the main features of the abdominal wall.

Physiology
The course aims to enable medical students to understand the physiological processes underlying the physiology of the gastrointestinal tract. This will provide them with the tools to consciously address the aspects related to the pharmacology and pathology of the GI tract itself.

Pharmacology
Main aim of the course is to provide students with gastrointestinal pharmacology. The course will present and describe available pharmacological strategies for the treatment of gastric pathologies (gastric acidity, ulcers, esophageal reflux), gastrointestinal motility, emesis, hepatic and pancreatic diseases, gut inflammation. Mechanism of action, therapeutic properties, drug interactions, and side effects will be presented.

Pathology
To provide the pathology knowledge underlying different diseases affecting the digestive system.
At the end of the course the student will be able to:

1. Integrate the clinical data with cytological, histological and molecular aspects of different digestive system diseases.
2. Understand the pathobiology of these entities.
3. Employ normal histology knowledge and others basic disciplines for understanding organs and/or apparatus pathologies.
4. Critically evaluate the commonly used diagnostic methods in pathology

Diagnostics (Radiology)
To provide the basic knowledge concerning the most important imaging modalities and their clinical use in the context of gastroenterologic radiology. The role of conventional radiology and of cross sectional imaging, including hybrid modalities will be assessed.
The main purpose of the course is to illustrate the potential of these imaging techniques in order to determine correct clinical management of the diseases.

Surgery
The course aims to equip students with the necessary tools and knowledge to make accurate clinical diagnoses of various surgical diseases, to formulate appropriate differential diagnoses among different pathological entities, and to establish the foundations for correct surgical (and non-surgical) treatment indications by providing technical and strategic tools for treating different diseases

Gastroenterology and Hepatology
The primary goal of the course is to provide students with the pathophysiologic basis of the digestive and liver systems in order to make correlations between the inner mechanisms of diseases and their clinical expression. The student will be able to interpret symptoms, signs and laboratory tests as well as radiologic and endoscopic findings. Clinical tools to understand concepts of organ-limited disease, system involvement or systemic disease will be provided.

Contents

Anatomy of the Digestive Tract
Detailed description of abdominal viscera and revision of abdominal wall main features.

Physiology
The course is based on the systematic presentation of physiological concepts underlying the functioning of the digestive tract. The mechanism leading to function imbalance cannot be appreciated without a deep understanding of the underlying biophysical and physiological mechanisms. Therefore, we will present such mechanisms that guarantee functions at the cellular, tissue, organ and apparatus level and at the integrated level.

During the course, the effects of the aging process on the physiology of the gastrointestinal system and the effects due to gender differences will be emphasized

Pharmacology
Main classes of drugs, mechanisms of action, drug interactions and precautions.

Pathology
The course will address the pathogenetic, histological, cytological and molecular aspects of various neoplastic and non-neoplastic pathologies of the digestive tract, addressing the correlations with the clinical/instrumental data through case examples and references to the literature, with hints at the increasingly important role of the application of digital and molecular pathology methods in this field of human pathology.

Diagnostics (Radiology)
Conventional X rays examination efficacy in various clinical settings. Computed tomography, and magnetic resonance will be extensively discussed as the pillars of gastroenterologic radiology. The potential of ultrasound examination will be shown

Surgery
Principle of diagnosis and treatment of benign and malignant pathologies of oesophagus, upper GI, pancreas, lower GI, spleen, abdominal wall, biliary tract and liver with reference to hepatic transplantation

Gastroenterology and Hepatology
Principle of diagnosis and treatment of benign and malignant pathologies of oesophagus, upper and lower GI tract, pancreas, biliary tract and liver

Detailed program

Anatomy of the Digestive Tract
Surface anatomy: surface landmarks of the abdominal wall: xiphoid process, costal margin, iliac crest, pubic tubercle, symphysis pubis, inguinal ligament, superficial inguinal ring, umbilicus, linea alba, linea semilunaris and tendinous insersections of the rectus abdominis. Abdominal lines: transpyloric plane, subcostal plane, intercristal plane. Abdominal quadrants.
Abdominal wall: anterolateral and posterior abdominal wall. Skin, superficial fascia, deep fascia. Muscles: external and internal oblique, transversus, rectus abdominis, pyramidalis. Rectus sheath. Fascia transversalis. Arteries, veins, lymph vessels and nerves of the anterolateral abdominal wall. Inguinal canal: deep and superficial inguinal rings, walls of the inguinal canal.
Peritoneum: general arrangement, ligaments, omenta, mesenteries, peritoneal cavity. Relationships of the different organs to their peritoneal covering. Intraperitoneal, retroperitoneal and subperitoneal organs. Peritoneal pouches, spaces and recesses. Lesser sac and epiploic foramen. Functions of the peritoneum.
Detailed description of gastrointestinal system viscera and associated glands: position, shape, size, parts, relations, vascularisation, lymphatic drainage, and innervation of: stomach, duodenum, cecum, ascending, descending and transverse colon, appendix, liver, gallbladder, pancreas. A specific focus is given on portal system.

Physiology

- Functions and general characteristics. Structure of the gastro-intestinal tract. Secretion. Motility.
- Nervous control of the digestive function. Enteric nervous system. Electrophysiology of smooth muscle cells of the gastrointestinal tract.
- Hormonal control of motility of the gastrointestinal tract (gastrin, CCK, secretin).
- The oral cavity.
- The chemical senses of taste: physiology of taste and smell. Salivary secretion. Stomach and gastric secretion (composition and regulation).

- Intestinal secretions. Pancreatic secretion (composition and regulation). Liver secretion (composition
- and regulation). Digestion and absorption.

Pharmacology
Drugs for the treatment of gastric acidity, peptic ulcer, esophageal reflux.
Drugs for the control of gastrointestinal motility: prokinetics and treatment of stypsis and diarrhea.
Drugs for the treatment and prevention (vaccines) of hepatic and pancreatic diseases.
Anticancer drugs for the treatment of gastrointestinal neoplasia.
Work in groups: the microbiome.

Pathology
The Digestive Pathology course will focus on the following topics:
Precancerous lesions of the intestine and classification of intestinal polyps
Adenocarcinoma of the colon
Gastric precancerous lesions and stomach adenocarcinoma
Neuroendocrine tumors of the digestive system
Fine needle aspiration (FNA) in the characterization of pancreatic lesions

Diagnostics (Radiology)
Conventional digital radiology as a basic approach in emergengy. CT and MRI techniques as the most important means to determine the diagnosis and to generate the adequate follow up protocols. Basic information about the method of image interpretationswill be provided

Surgery
Use of different surgical technologies (minimally invasive laparoscopic surgery and minimally invasive robotic surgery).
Basics of emergency surgery.
Surgical treatment of abdominal wall defects.
Surgical treatment for esophageal pathology, upper and lower gastrointestinal tract conditions.
Surgical treatment of spleen pathology.
Surgical treatment of pancreatic disease with particular reference to the treatment of pancreatic malignancy.
Surgical treatment of the hepatobiliary tract, with particular reference to the indication for minimally invasive liver surgery and liver transplantation, including for oncological diseases of the liver and intra- and extra-hepatic bile ducts.

Gastroenterology and Hepatology
Autoimmune liver/Cholestatic diseases
Pancreatitis
IBD/Celiac disease
DILI
Multidisciplinary approach to NAFLD
Viral Hepatitis
Storage diseases
Acute alcoholic hepatitis
Endoscopy in PSC
AI in radiology
Cirrhosis 1
GI Bleeding
Upper GI
Cirrhosis 2
ACLF
Multidisciplinary lessons:
--Chronic Hepatitis
• Pathology & Diagnostic
• Clinical Hepatology

--HCC and liver transplant
• Pathology & Diagnostic
• Clinical Hepatology
• Interventional Radiology
• Surgery
--IBD + Microbiota:
• Pathology & Diagnostic
• Clinical Gastroenterology
• Endoscopy
• Surgery
--GI TUMORS:
• Pathology & Diagnostic
• Clinical Gastroenterology
• Endoscopy
• Surgery
PBL
Neuroendocrine tumors
GI bleeding (upper lower)
Acute abdomen(diverticulitis, peritonitis, perforations)
Esophageal disorders

Prerequisites

Knowledge of the preparatory courses as indicated in the regulations of the degree course in Medicine and Surgery.
Fundamental knowledge on cell biology and general pharmacology
Fundamentals of Human Physiology.
Basic knowledge of human anatomy, phisiology, and general pathology
Anatomy and histology

Teaching form

Anatomy of the Digestive Tract
10 hours held over 2 days in the Anatomy room (Monza, Asclepio building): didactive activities will be divided into a frontal lesson and an interactive part. Both parts will rely on live virtual dissections via Anatomage table. Students will be divided intro group and perform dissections directly; a gamification approach will be used (tournament among groups).

Physiology
8 hours of lectures (didactic mode) and 2 hours of interactive lessons.

Pharmacology:
8 hours frontal lessons.
2 hours interactive lesson: work in groups

Pathology
10 hours in-person oral lessons

Diagnostics (Radiology)

10 hours frontal lessons in presence

Surgery and **Gastroenterology and Hepatology**
Surgery A:
10 hours of frontal and interactive lectures & Multidisciplinary sessions in presence
Chirurgia 2
10 hours of frontal and interactive lectures & Multidisciplinary sessions in presence
Gastroenterologia & Epatologia A
10 hours of frontal and interactive lectures & Multidisciplinary sessions in presence
Gastroenterologia & Epatologia B
10 hours of frontal and interactive lectures & Multidisciplinary sessions in presence
Gastroenterologia & Epatologia C
10 hours of frontal and interactive lectures & Multidisciplinary sessions in presence

within the Vertical Tract of Digestive & Liver Disease sessions of Problem-based Learning & Case-based Learning in presence shall be held

Textbook and teaching resource

Anatomy of the Digestive Tract
Treatise on Human Anatomy (Systemic Approach), Topographic Approach, Atlas - G. Anastasi G. et al.; E. Mtui (editor).
Gray's Anatomy: The Anatomical Basis of Clinical Practice, by S. Standring.
Atlas of Human Anatomy, by F. H. Netter.
Human Anatomy Atlas, by G. Anastasi, E. Gaudio, C. Tacchetti, E. Mtui.

Physiology
Guyton & J.E. Hall, Textbook of Medical Physiology, Elsevier;
Boron WF, Boulpaep EL, Medical Physiology, Ed. Elsevier.
Reviews or scientific papers recommended by the Professor During Lectures

Pharmacology
Bertram G. Katzung “Basic and clinical pharmacology” 14th Edition. LANGE
Goodman & Gilman “The Pharmacological Basis of Therapeutics” 13th Edition, Laurence L. Brunton, Randa Hilal-Dandan, Björn C. Knollmann. McGraw-Hill Education
Rang & Dale “Pharmacology” 14th Edition, Elsevier.

Pathology
Kumar V, Abbas A K, Aster J C; Robbins and Cotran Pathologic Basis of Disease Elsevier, 10th ed

Diagnostics (Radiology)
Textbook of gastrointestinal radiology. Richard M Gore ed. Elsevier Health Europe

Surgery
Lessons on power point slides with references to national and international guidelines
Sabiston. Textbook of Surgery. Saunders
F. Minni. Chirurgia Generale. Zanichelli
F. D’Amico. Manuale di Chirurgia Generale. Piccin
References available on the scientific biomedical resource Pubmed

Gastroenterology and Hepatology

- Sleisinger & Fordtran's Gastrointestinal and Liver Disease E-dition. Text with Continually Updated Online Reference (www.sfgastro.com): Pathophysiology, Diagnosis, Management & Liver Disease (Sleisinger/Fordtran). Eds: Feldman, Mark; Friedman, Lawrence; Brandt, Lawrence J. ISBN: * 978-1-4160-3245-8.
- Harrison's Principles of Internal Medicine: The 20th edition of the book, edited by Dennis Kasper, Anthony Fauci, Stephen Hauser, Dan Longo, J. Larry Jameson and Joseph Loscalzo, (17 August 2018). The 21st edition of the book to be released on 28 March 2022
- Zakim and Boyer's Hepatology. A Textbook of Liver Disease. Seventh Edition (2018) (Edited by: Arun J. Sanyal, Thomas D. Boyer, Norah A. Terrault, and Keith D. Lindor)
- Clinical Gastrointestinal Endoscopy: A Comprehensive Atlas. (2018) Ed. Hoon Jai Chun, Suk-Kyun Yang, Myung-Gyu Choi
- Malattie Dell'apparato Digerente 2019-2022: Unigastro (Editrice Gastroenterologica Italiana)
- Reviews

Semester

II semester

Assessment method

Before being allowed to sustain the oral examination the student should meed the following requirements:

- 70% of attendance to the GI Clerckship
- Approval from the tutor of the acquisition of the required skills** (details of the skills in syllabus Clerkship 9 Gastroenterology & Hepatology I & II)
- to sustain and pass the weritten Multiple Choice Test (a minimum score of 27 out of 45)
- the oral examination shall be carried out by a multidisciplinary team od teachers, in order to cover all the topics
  (basic & clinical GI) presented during the course according with the present sillabus, with the discussion of both
  open issues and case-based clinical evaluation

All assessments will be carried out in English language

Office hours

The teachers are reachable by e-mail

Anatomy of the Digestive Tract: *paola.alberti@unimib.it *
Physiology: *ilaria.rivolta@unimib.it*
Pharmacology: *laura.musazzi@unimib.it*
Pathology
Diagnostics (Radiology)
Surgery
Gastroenterology and Hepatology: *stefano.fagiuoli@unimib.it*

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | GENDER EQUALITY