FACULTY OF MEDICINE NO. 1

STUDY PROGRAMME "0912.1 MEDICINE"

DEPARTMENT OF SURGERY NO. 1 "NICOLAE ANESTIADI"

APPROVED
at the meeting of Quality Assurance and Curricular Evaluation in Medicine Committee
Minutes no. 1 of 16.09.21

Chairperson, hab. dr. in med. sc., univ. prof.
Suman Serghei_____

APPROVED
at the meeting of the Council of the Faculty of Medicine no.1
Minutes no. 1 of 21.09.21

Dean of the Faculty, hab. dr. in med. sc., univ. prof.
Plăcintă Gheorghe _____

APPROVED
at the meeting of the Department of Surgery no. 1 "Nicolae Anestiadi"
Minutes no. 2 of 15.09.2021

Head of Department, hab. dr. in med. sc., univ. prof.
Rojnoveanu Gheorghe_____

CURRICULUM
SURGICAL DISEASES

Integrated studies / Cycle I, Bachelor's degree

Course type: **Compulsory subject**

The curriculum was co-authored by the following team:

Rojnoveanu Gheorghe, hab. dr. in med. sc., univ. prof.;
Berliba Sergiu, PhD, assoc. prof.;
Vozian Marin, PhD, assoc. prof.;

Chisinau - 2021

I. PRELIMINARY REMARKS

- General presentation of the subject: place and role of the discipline in the formation of the specific competences of the training programme/speciality

Basic surgical pathology in the university system is studied at the Department of Surgery No.1 "Nicolae Anestiadi" during the fourth year (eighth semester). Students study in depth the etiopathogenesis, classification, symptomatology, positive and differential diagnosis, treatment of basic abdominal surgical conditions according to the programme during the lectures and practical classes.

The major precondition is the acquisition of the study material and gaining practical skills that will allow the future doctor to handle an emergency situation by developing an appropriate algorithm of examination and treatment.

After attending the surgery module during the fourth year, the student has **to know:**

- the social-economic problem of abdominal surgical diseases and thoracic and abdominal trauma included in the curriculum;
- the frequency, aetiology and pathogenesis of abdominal surgical diseases and abdominal and thoracic trauma;
- the current methods of surgical pathology investigation (emergency and elective);
- the current methods of intra-abdominal surgical diseases and abdominal and thoracic traumas treatment;
- the methods of prevention of chronic and acute conditions of the abdominal organs, etc.

After attending the surgery module during the fourth year, the student has **to be knowledgeable of:**

- the clinical diagnosis of surgical disorders of the abdominal organs;
- the structure of the algorithm of investigation of the surgical patient both in emergency and elective situations;
- the practical skills necessary to examine the patient and establish the diagnosis;
- the classical methods of treatment of the most common surgical pathologies and when to apply them;
- the provision of emergency medical aid in emergent surgical pathology and traumas along with the specialist doctors;
- the necessary skills to provide pre- and post-operative care to a surgical patient.

Mission (goal) of curriculum in professional training:

- The outcome of the study of surgical diseases is the development of each student's clinical thinking at the patient's bedside, formulation of diagnosis, establishment of surgical tactics, amassing practical manual skills, knowledge of basic surgical techniques. Throughout the year of study, the theoretical and practical knowledge is verified during oral assessments and tests.
- At the end of the module, each student will work with a patient's observation sheet and will have to pass a three-stage exam: a case presentation, test and oral interview, the average grade being composed of the respective coefficients.

- **Language (s) of instruction**: Romanian, Russian, English, and French
- **Beneficiaries**: fourth-year students, Faculty of Medicine no. 1 and no. 2, speciality: Medicine

II. MANAGEMENT OF THE DISCIPLINE

Code of discipline		**21-066. S. 08. O. 066**	
Name of the discipline		**Surgical Diseases**	
Discipline Coordinator		**Gheorghe Rojnoveanu**, hab. dr. in med. sc., univ. prof	
Year	**IV**	Semester	**VIII**
Total number of hours, including:			**150**
Lectures	**34**	Practical/laboratory hours	**34**
Seminars	**34**	Self-training	**48**
Clinical internship			**0**
Form of assessment	**E**	Number of credits	**5**

III. TRAINING OBJECTIVES OF THE DISCIPLINE

At the end of the discipline study the student will be able to:

at the level of knowledge and understanding:

- to recognize the surgical diseases in a patient;
- to know the peculiarities of the onset and evolution of different surgical pathologies;
- to understand the methods and peculiarities of patients' examination;
- to know when and how to transfer a patient to specialised departments;
- to know the incidence, aetiology and pathogenesis of abdominal surgical diseases, as well as abdominal and chest trauma;
- to be familiar with modern diagnostic methods (emergency and elective) in surgical diseases;
- to distinguish between modern treatment methods of abdominal surgical diseases and abdominal and chest traumas;
- to be acquainted with the prophylaxis methods of acute and chronic pathologies of the abdominal organs.

at the application level:

- to collect and evaluate correctly the history data;
- to perform correct physical examination of the patients with different surgical pathologies and traumas;
- to establish the correct presumptive diagnosis;
- to assess the severity of the patients' general health status;
- to provide emergency care in critical situations.

at the integration level:

- to be aware of the role of surgical diseases in medicine;
- to address creatively the fundamental medicine issues;
- to create interrelations between the discipline Surgical Diseases and other medical disciplines;
- to implement and integrate the obtained knowledge in other fundamental disciplines;

- to evaluate adequately the acquired knowledge;
- to assimilate new trends related to surgical diseases and to integrate them into other medical disciplines.

IV. PROVISIONAL TERMS AND CONDITIONS

In order to understand well the discipline a student should have fundamental knowledge in the field of biology, chemistry, anatomy, histology, biochemistry, pharmacology, pathomorphology, pathophysiology, semiotics of general surgery etc., acquired during the first three years.

V. TOPICS AND ESTIMATION OF ALLOCATION OF HOURS

Lectures, practical hours/laboratory hours/seminars and self-training

No.	TOPIC	Number of hours		
		Lectures	Practical hours	Self-training
1.	Acute appendicitis: classification. Clinical features. Diagnosis and differential diagnosis, surgical treatment.	2	4	2.8
2.	Evolutional complications of acute appendicitis: symptoms, diagnosis, and management. Postoperative complications. Chronic appendicitis.	2	4	2.8
3.	Intestinal obstruction: aetiology, pathogenesis. Homeostasis and hydro-saline imbalances in intestinal obstruction. Classification, clinical features, diagnosis, differential diagnosis.	2	4	2.8
4.	Intestinal obstruction: clinical forms (volvulus, intussusceptions, obstructive tumours, gallstone ileus etc), clinical features, differential diagnosis, surgical management. Pre- and postoperative period: preoperative preparation, postoperative treatment, methods of intestinal function stimulation, postoperative complications.	2	4	2.8
5.	Hernias of the abdominal wall. Anatomy, topography of the abdominal wall. Simple (reducible) hernias. Diagnosis. Treatment.	2	4	2.8
6.	Complications of hernias. Strangulated hernias. Clinical features. Diagnosis. Surgical treatment.	2	4	2.8
7.	Cholelithiasis. Chronic lithiasic cholecystitis: clinical forms, symptoms, diagnosis and differential diagnosis. Biliary colic: variants of evolution, clinical features. Treatment. Postoperative complications.	2	4	2.8
8.	Complications of cholelithiasis: classification, prophylaxis. Acute cholecystitis: aetiology, classification, surgical tactics, postoperative treatment. Choledocholithiasis, acute Cholangitis: definition clinical features, diagnosis. Treatment methods.	2	4	2.8
9.	Acute pancreatitis. Anatomy and physiology of the pancreas. Aetiology, pathogenesis. Clinical features. Methods of diagnosis. Medical and surgical treatment.	2	4	2.8
10.	Early complications of acute pancreatitis: classification, clinical features, diagnosis, treatment. Late complications of acute pancreatitis: classification, clinical features, diagnosis, treatment.	2	4	2.8
11.	Peptic ulcer disease: etiopathogenesis, classification, clinical and paraclinical diagnosis. Complications of the peptic ulcer. Treatment of the gastroduodenal ulcer: indications. Surgical procedures, postoperative management.	2	4	2.8
12.	Acute complications of the gastroduodenal ulcer: perforation, bleeding. Clinical features. Diagnosis. Surgical management.	2	4	2.8

No.	TOPIC	Number of hours		
		Lectures	Practical hours	Self-training
	Chronic complications of the gastroduodenal ulcer: penetration, pyloric stenosis, malignancy. Clinical features. Diagnosis. Surgical management.			
13.	Abdominal trauma: classification, clinical features, paraclinical methods of examination. Traumatic injuries of solid and hollow abdominal organs: clinical features, diagnosis, treatment.	2	4	2.8
14.	Thoracic trauma: classification, clinical features, diagnosis, treatment.	2	4	2.8
15.	Peritonitis: etiopathogenesis, classifications, primary, secondary, tertiary peritonitis. Clinical features. Diagnosis and differential diagnosis.	2	4	2.8
16.	Treatment of peritonitis: preoperative preparation; intraoperative tactics: volume of surgery, lavage and drainage of the peritoneal cavity; postoperative management.	2	4	2.8
17.	Chronic venous insufficiency. Classification. Aetiology. Clinical features. Diagnosis. Treatment. Superficial and deep acute thrombophlebitis. Clinical features. Diagnosis. Treatment. Acute phlebothrombosis: clinical features, diagnosis and differential diagnosis. Post-thrombophlebitic syndrome: etiopathogenesis, classification, clinical features, treatment. Pulmonary thromboembolism.	2	4	2.8
		34	**68**	**48**
Total		**150**		

VI. PRACTICAL WORKS ACQUIRED AT THE END OF THE COURSE

General part:

1. Drafting current medical documents: observation sheet, evolution.
2. A correct interpretation of medical history.
3. Examination of patients for diagnosis and differential diagnosis of various surgical conditions: Acute appendicitis; Intestinal occlusion; Abdominal wall hernias; Varicose veins of the lower limbs; Gallstone disease; Acute pancreatitis; Peritonitis; Ulcerative disease; Chest and abdominal trauma.
4. Interpretation of laboratory test results: determination of any changes in blood count, urine, immunobiochemical indices, acid-base balance, coagulogram.
5. Monitoring of oxygen saturation of haemoglobin in arterial blood (pulse oximetry).
6. Selection of the necessary instruments and application of the nasogastric tube.
7. Removing the stiches from the wound.
8. Selection of instruments necessary for the care and removal of postoperative drains from the abdomen.

9. Insertion of urinary catheters on a moulage.
10. Selection of the instruments required for enema administration.
11. Selection of the instruments used to stimulate bowel movement (hypertonics, Ognev'e enema, etc.).
12. Selection of the instruments necessary for the care of patients with enterostomy, colostomy.

Special part:

Acute appendicitis

1. Indication of points of maximum pain in acute appendicitis
2. Examination of the patient with acute appendicitis, displaying the following clinical signs: Dieulafoy, Rovsing, Sitcovsky, Bartomier-Mihelson, Cope, Blumberg, Mandel-Razdolsky.

Abdominal wall hernias

1. Indication of weak points and areas of the abdominal wall
2. Differentiation of signs of reducible, non-reducible and strangulated hernias
3. List the criteria for differentiating direct and indirect inguinal hernias
4. Application of the postoperative suspension-like compression bandage after inguinal herniotomy

Intestinal obstruction

1. Assessment of the level of intestinal obstruction according to clinical data
2. Commenting on x-ray films (plain, Schwartz's test, barium enema) in intestinal obstruction.
3. Enumeration of the signs of differentiation of the upper and lower intestinal obstruction on the radiological image
4. Indication (in writing) of the preoperative preparation of a patient with acute intestinal obstruction

Peptic ulcer complications

1. X-ray films description of a patient with a perforated ulcer
2. Selection of the instruments needed to perform pneumogastrography
3. Demonstration of the disappearance of liver dullness when suspecting a perforated gastroduodenal ulcer
4. Determination of the degree of digestive haemorrhage according to clinical and laboratory data
5. Determination of gastroduodenal ulcer haemorrhagic activity by clinical, endoscopic and laboratory data
6. Prescription of drug treatment to the patient with ulcerative haemorrhage
7. Detection of Kussmaul sign and Patkin's triad in ulcerative stenosis
8. Description of the barium radiology series of the digestive tract of a patient with pyloric stenosis
9. Selection of laboratory tests characteristic of Darrow's syndrome in decompensated pyloric stenosis
10. Selecting the necessary instruments and performing gastric lavage after gastrosurgery.
11. Selecting the required instruments to install the Sengstaken-Blakemore tube to manage the haemorrhage due to oesophageal varices.

Surgical pathology of the gallbladder and bile ducts

1. Examination of the patient with acute cholecystitis, displaying Murphy, Ortner, Mussie-Gheorghievski, Blumberg's signs.
2. Interpretation of general and biochemical blood tests in patients with acute cholecystitis, chronic choledocholithiasis, mechanical jaundice of various aetiologies.
3. Commenting on radiology clichés (fistulocholangiography, transcutaneous, transhepatic, cholecystocholangiography, fistulography, ERCP).
4. Commenting ultrasonographic images, computed tomography in case of gallstones disease.

5. Prescribing preoperative treatment to the patient with acute cholecystitis
6. Biliary drain care (cholecystostomy, common bile duct drainage). Debriefing on criteria and terms for removal of biliary drainage.

Acute pancreatitis

1. Examination of the patient with acute pancreatitis, showing Bereznigovsky, Gray-Turner, Culen, Bonde, Gobie, Körte, Voscresensky, Mayo-Robson's signs
2. Interpretation of blood, urine, peritoneal exudate, pleural fluid tests in patients with acute pancreatitis
3. Interpretation of radiological signs of the chest and abdomen in acute pancreatitis
4. Interpretation of ultrasonography and computer tomography results in acute and chronic pancreatitis
5. Prescription of treatment to a patient with acute pancreatitis at the onset of the severe form of disease.

Abdominal trauma

1. Examination of the patient with blunt abdominal injury and suspicion of injury to the parenchymatous organs (muscular guarding, free fluid (displaceable dullness), exclusion of pneumoperitoneum, Blumberg's sign, etc.).
2. Examination of the patient with blunt abdominal trauma and suspicion of damage to the cavitary organs (presence of muscular guarding, pneumoperitoneum, free fluid, Blumberg's sign, etc.).
3. Determination of the degree of internal haemorrhage according to clinical data
4. Determination of the degree of internal haemorrhage according to laboratory data
5. Interpretation of the presence of pneumoperitoneum on the x-ray film of the abdomen in orthostatism and on the laterogram in the patient with blunt abdominal trauma
6. Selection of the equipment required for paracentesis (diagnostic peritoneal lavage). Enumeration of the criteria for positive findings in paracentesis.

Chest trauma

1. Examination of the patient with blunt trauma and suspicion of damage to the organs of the thorax (presence of rib fractures, tracheal deviation, pneumothorax, haemothorax, flail chest, intercostal retraction, distended jugular veins).
2. Examination of the patient with chest trauma and description of the semiology (inspection, auscultation, percussion) in relation to various lesions (pneumothorax, haemothorax).
3. Interpretation of the presence of haemo/pneumothorax on the x-ray film of the chest in the patient with chest trauma.
4. Description and application of occlusive dressing in case of open pneumothorax.
5. Identification of signs in case of tension pneumothorax (with valve). Description of the stages and performance of needle decompression.
6. Selection of the necessary equipment for pleural puncture. Anatomical sites. Describe the stages and perform pleural puncture on the moulage in case of hydrothorax.
7. Selection of the equipment required for thoracentesis. Anatomical sites. Description of the stages and performance of the thoracentesis on a moulage.
8. Enumeration of indications/criteria for thoracotomy.

Peritonitis

1. Performing abdominal examination of the patient with peritonitis (muscular guarding, free fluid in the abdominal cavity, Blumberg's sign).

2. Prescription of the methods of stimulating the intestine of the patient with peritonitis in the postoperative period.
3. Prescription of antibacterial and infusion treatment to the patient with generalised peritonitis.
4. Interpretation of radiological signs of the abdomen in generalised peritonitis.
5. Interpretation of radiological signs of the abdomen in localised circumscribed peritonitis (abscesses).
6. Commenting on imaging data (USG, radiology, CT) of intra-abdominal abscesses.
7. Interpretation of blood tests, urine, peritoneal exudate in patients with generalised peritonitis.

Surgical pathology of the venous system

1. Examination of a patient with varicose veins, demonstrating functional tests: Brodie-Trendelenburg-Troianov test, Delbet test, Pertes test, Pratt-I, Pratt-II tests, Sheinis test (the three tourniquets test).
2. Applying the compressive elastic bandage on the lower limbs in patients with varicose veins.
3. Interpretation of coagulogram results. Interpretation of Duplex scan results of lower limb veins.
4. Examination of a patient with acute thrombophlebitis of the lower limb veins, displaying characteristic signs.
5. Selection of devices required for temporary and permanent haemostasis in case of haemorrhage from ruptured varicose vein.
6. Prescription of the treatment in thrombophlebitis of the superficial and deep veins of the lower limbs.
7. Selection of prevention measures for thromboembolic complications in surgical patients.

VII. REFERENCE OBJECTIVES AND UNITS OF CONTENT

Objectives	Units of Content
Topic 1. Appendicitis	
• To define the notion of acute and chronic appendicitis; • to know the classification, aetiology, pathogenesis and clinical picture; • to know and reason clinical, laboratory and instrumental diagnostic methods; • to comment on possible complications of acute and chronic appendicitis; • to apply knowledge from other clinical disciplines; • to draw conclusions; • to develop personal opinions on morbidity and mortality from acute appendicitis.	1. Anatomy and physiology of the ileocecal junction. Vermicular appendix: anatomical and physiological data. Acute appendicitis: notion, epidemiology, etiopathogenesis, topographic, morphopathological and clinical classification. Clinical picture, diagnosis, differential diagnosis. Peculiarities of acute appendicitis depending on the location of the vermicular appendix (retrocecal, mesoceliac, pelvic and subhepatic). Acute appendicitis in children, pregnant women, the elderly. Surgical treatment: anaesthesia, surgical access, surgical procedures. Pre- and postoperative period. 2. Complications of acute appendicitis: evolutionary - appendicular plastron, peritonitis, regional and distant abscesses, pylephlebitis, sepsis; intraoperative – haemorrhage, iatrogenic lesion of the viscera; postoperative – intra-abdominal haemorrhage, peritonitis, mesoceliac abscess, subphrenic abscess, Douglas space, early intestinal occlusion; plague - seroma, hematoma, parietal phlegmon, suppuration. Diagnostic and therapeutical errors in acute appendicitis. 3. Chronic appendicitis: clinical picture, pain points, diagnosis,

Objectives	Units of Content
	differential diagnosis, treatment.
Topic 2. Hernias	
• To define the notion of hernia of the abdominal wall, eventration and evisceration; • to know the manner and peculiarities of the formation of hernias of the abdominal wall; • to know the principles and methods of diagnosis and treatment of the anterior abdominal wall hernias; • to know the peculiarities complications of abdominal wall hernias; • to know the surgical techniques for the treatment of hernias; • to model the prevention of hernias of the anterior abdominal wall; • to model the preparation of patients for the surgical treatment of hernias; • to apply the knowledge gained from other disciplines	1. General notions: hernia, eventration, evisceration. The anatomical elements of hernia. Etiopathogenesis of hernias. Local and general causes of hernia development. Predisposing and favouring factors. Classification of hernias, symptoms of free hernias, diagnosis and differential diagnosis. Treatment: general conservative and surgical principles. 2. Complications of hernias. Irreducible hernia: definition, morphopathology, clinical-evolutionary forms. Treatment. Strangled hernia: definition, strangulation mechanisms, morphopathology of strangulated hernia. Clinical picture, diagnosis, treatment. Peculiarities of the operation. Medical tactics in case of spontaneous or forced replacement of strangulated hernia. Evolutionary complications of strangulated hernia: intestinal occlusion, peritonitis, phlegmon of the hernial sac, intestinal fistula. Atypical strangulation: parietal (Richter), retrograde (Maydl), Littre. Brock Hernia. Morphopathological and clinical features. Surgical tactics. 3. Particular forms of hernias. Inguinal hernias. Anatomy of the groin region. Direct and indirect inguinal hernias. Congenital inguinal hernia. Sliding inguinal hernia: morphopathological features, clinical picture and diagnosis. Surgical tactics. Surgical procedures in indirect and direct inguinal hernias. 4. Congenital inguinal hernia: the clinical picture, the peculiarities of the herniotomy. 5. Femoral hernia. Anatomy, etiopathogenesis, clinical picture, diagnosis, differential diagnosis. Hernioplasty procedures. 6. Umbilical hernias. Umbilical hernias in children. Clinical picture, diagnosis, evolution. Surgical treatment of umbilical hernias. 7. Linea alba hernias. Anatomical considerations, clinical picture, diagnosis, treatment: hernioplasty methods. 8. Recurrent and postoperative hernias: notion, causes of development, clinical picture, indications for surgery, surgical methods of treatment. Notion of auto- and alloplasty.
Topic 3. Acute intestinal obstruction	
• To define the notion of acute intestinal obstruction;	1. Acute intestinal obstruction: notion, classification. Proximal and distal acute intestinal occlusion: clinical picture, paraclinical

Objectives	Units of Content
• to know the way and the peculiarities of establishing the intestinal obstruction; • to know the methods of decompression of the digestive tract; • to know the methods of correction of hydroelectrolytic disorders in acute intestinal occlusion; • to know the classification of acute intestinal occlusion; • to know the principles and methods of diagnosis and treatment of various forms of intestinal obstruction; • to describe radiology clichés and CT sequences in acute intestinal obstruction; • to know the particularities of the complications in the acute intestinal obstruction; • to know the surgical techniques for solving the acute intestinal obstruction; • to model the clinical and radiological diagnosis of acute intestinal obstruction; • to model the preparation of the patients for the bariatric examination in case of upper and lower intestinal occlusion; • to apply the knowledge gained from other disciplines.	methods (general radiography, irrigoscopy, rectoromanoscopy, colonoscopy) for investigation of intestinal obstruction. 2. Pathophysiology of mechanical intestinal obstruction: general and local manifestations. Disorders of the hydrosaline balance and the acid-base system. Evolutionary complications. 3. Medical treatment (general aspects) of acute intestinal obstruction. Preoperative preparation, intra- and postoperative period. Methods of digestive tract decompression, hydrosaline rebalancing and acid-base balance. Intestinal viability criteria, indications for bowel resection, intestinal resection limits in intestinal obstruction. 4. Mechanical intestinal occlusion by obstruction: notion, causes of obstruction (intraluminal obstruction, external compression, parietal wall damage, etc.). Clinical picture, diagnosis, treatment. 5. Acute adherent intestinal occlusion: symptomatology, diagnostic methods. Surgical tactics in high acute adherent intestinal occlusion. Conservative treatment and the scope of surgery: viscerolysis, flange transection, bowel resection, enterostomies, etc. 6. Intestinal occlusion by strangulation: definition, clinical forms (intestinal volvulus, intestinal nodule, etc.). Symptomatology, diagnosis. Surgical tactics. Mixed intestinal obstruction: intestinal invagination, strangulated hernia. Causes, methods of investigation. Clinical picture, diagnosis. Surgical tactics. Surgery options. 7. Dynamic intestinal occlusion: spastic and paralytic. Etiopathogenesis. Clinical picture, differential diagnosis. Surgical tactics. Methods of stimulating the intestine.
Topic 4. Gallstone disease	
• to define the notion of gallstone disease; • to know the anatomy and physiology of the liver, gallbladder and bile ducts; • to demonstrate the interaction of the liver, gallbladder and bile ducts with the secretion processes of other organs of the	1. Anatomy and physiology of the liver and bile ducts. Classification of bile duct disorders. Examination methods: clinical, laboratory, invasive, and non-invasive. 2. Gallbladder lithiasis: notion, the mechanisms of formation of gallstones. Epidemiology. The natural history of the disease. Etiopathogenesis of gallstones: the theory of infection, stasis theory (Aschoff), humoral, cholesterol, and physico-chemical theory. Clinical forms of chronic calculous cholecystitis. Therapeutic options (conservative, surgical treatment, etc.).

Objectives	Units of Content
peritoneal cavity in a normal and pathological case; • to comment on the significance of the clinical forms of chronic cholecystitis; • to know the laboratory and instrumental diagnostic methods in the detection of gallstones, mechanical jaundice and acute cholecystitis; • to reason the directions and stages of the conservative and surgical treatment of acute and chronic cholecystitis, as well as in case of mechanical jaundice; • to differentiate the jaundice syndrome; • to interpret the results of USG, ERCP, CT, MRI and laparoscopy in chronic gallstones, acute cholecystitis and mechanical jaundice; • to apply the knowledge gained from other clinical and preclinical disciplines; • to draw conclusions; • to develop personal opinions on the importance of the liver, gallbladder and bile ducts in the normal and pathological physiology of the body, as well as interactions with other systems and organs of the pancreatoduodenal area.	Indications for surgery. Paraclinical diagnosis of chronic cholecystitis. Abdominal ultrasonography in gallstones: ultrasound signs in chronic cholecystitis, acute cholecystitis, choledocholithiasis. Surgery techniques. Intraoperative methods of bile duct investigation. Minimally invasive gallstones surgery. 3. Infectious, mechanical, degenerative complications of gallstone disease. 4. Acute cholecystitis: classification, clinical picture, methods of investigation, differential diagnosis. Surgical tactics in acute cholecystitis. Preoperative preparation and options of cholecystectomy in acute cholecystitis. Gallbladder empyema and hydrops. Clinical picture, diagnosis, treatment. 5. Choledocholithiasis. The natural history of main bile duct stones. Imaging diagnosis, computed tomography. Endoscopic retrograde cholangiopancreatography. Therapeutic options. The current role of minimally invasive surgery. 6. Mechanical jaundice: notion, aetiology, classification, pathophysiology, clinical picture. Imaging and biochemical diagnosis. Differential diagnosis of jaundice syndrome (pancreatic head cancer, Vaterian ampulloma, choledochal stenoses and biliary strictures, viral hepatitis, etc.). Peculiarities of surgeries in patients with mechanical jaundice. Methods of drainage of the main bile duct. Biliodigestive anastomosis. Prophylaxis of colemic haemorrhages. 7. Acute cholangitis: classification, clinical picture. Treatment.
Topic 5. Acute and chronic pancreatitis	
• to define the notion of acute and chronic pancreatitis; • to know the anatomy and physiology of the pancreas; • to demonstrate the interaction of the pancreatic gland with the processes of endocrine and exocrine secretion of other organs of the peritoneal cavity in normal and pathological cases;	1. Anatomy and physiology of the pancreas. Annular pancreas. Aberrant pancreas. 2. Acute pancreatitis: definition, aetiology. Classification of acute pancreatitis. Pathophysiology of acute pancreatitis. Symptomatology and diagnosis of acute pancreatitis according to the anatomical pathological forms and clinical evolution. Paraclinical diagnosis of acute pancreatitis: the role of ultrasound, endoscopic and laboratory investigations. Differential diagnosis of acute pancreatitis.

Objectives	Units of Content
• to comment on the clinical significance of acute pancreatitis; • to know the laboratory and instrumental diagnostic methods in the detection of acute and chronic pancreatitis; • to explain the occurrence of severe complications in case of acute pancreatitis; • to motivate the directions and stages of the conservative and surgical treatment of acute pancreatitis according to the evolutionary phase of the disease; • to apply knowledge to other disciplines; • to draw conclusions; • to develop their own opinions regarding the importance of the pancreas in the normal and pathological physiology of the organism, as well as its interactions with other systems and organs.	3. Conservative treatment of acute pancreatitis: basic principles. Surgical and endoscopic treatment of acute pancreatitis depending on the form of pancreatitis, its stages of evolution and its complications. Indications for surgery in the phase of septic-purulent complications. Conservative treatment and minimally invasive interventions. 4. Early complications of acute pancreatitis. Organ and multiple organ dysfunction syndrome. Fermentative peritonitis. Pancreatogenic shock. Volume and composition of shock and detoxification therapy. Parapancreatitis: symptoms, diagnosis and treatment. Indications for surgery, scope of surgery. 5. Septic-purulent complications. Late complications: pseudocyst, pancreatic fistula, diabetes, etc. Diagnosis, clinical picture, biochemical-humoral syndrome, differential diagnosis. 6. Postoperative acute pancreatitis: clinical-evolutionary features. Treatment. 7. Chronic pancreatitis: etiopathogenesis, classification, clinical picture, treatment.
Topic 6. Peptic ulcer complications	
• to define the notion of ulcer disease of the stomach and duodenum; • to know the anatomy and physiology of the stomach and duodenum; • to know the phases of gastric secretion and the methods of assessing gastric acidity; • to know the aetiology and pathogenesis of gastroduodenal ulcers; • to know the classification of gastric ulcer according to Johnson; • to demonstrate the interaction of the stomach and duodenum	1. Anatomical and physiological aspects of the stomach and duodenum. Methods for investigating patients with upper digestive tract pathology. Etiological classification of ulcerative diseases of the oesophagus-gastro-duodenal area. 2. Ulcerative disease. Causes and conditions of gastroduodenal ulcer. Infectious, “stress” (Selye), cortico-visceral, acid-peptic, vascular, etc. theories. Pathophysiology of the current concept of ulcer disease. Acid-peptic aggression factors. The role of Helicobacter pylori. Gastrointestinal protection factors. Gastric secretion: types of gastric secretion, assessment methods (pH-metry, Kay, Hollander tests, etc.). Using the results of the assessment of gastric secretion as indications for performing various methods of surgery on the stomach. 3. Morphopathology of gastroduodenal ulcer. Morphological-topographic classification of gastric (Johnson) and duodenal

Objectives	Units of Content
with the processes of hemocrine and exocrine secretion of other organs of the peritoneal cavity in norm and pathology; • to comment on the clinical significance of the symptoms of ulcer disease; • to know the laboratory and instrumental diagnostic methods in the detection of gastroduodenal ulcers; • to motivate the occurrence of complications in case of ulcer disease; • to motivate the directions and stages of the conservative and surgical treatment of chronic gastroduodenal ulcers and in the case of ulcer complications; • to know the classification of upper digestive haemorrhages and to motivate the tactics of conservative and surgical treatment in haemorrhages of various genesis; • to know the classification of the activity of ulcerative haemorrhages according to Forrest; • to complete the precancerous conditions and to know the signs of the malignancy of the gastric ulcer; • to know the methods of investigation, treatment and differential diagnosis of perforated gastroduodenal ulcer; • to know the diagnosis and treatment of hypovolemic shock in upper digestive haemorrhages; • apply knowledge to other clinical disciplines; • to draw conclusions;	ulcers. Clinical picture, clinical forms. Diagnosis: radiological and endoscopic examination. 4. Therapeutic principles in gastric and duodenal ulcer. Indications for surgery (absolute and relative). Operating techniques: gastric resection, vagotomy (types), gastric drainage (types). Radical and palliative operations in ulcer disease. 5. Complications of gastroduodenal ulcer: perforation, penetration, stenosis, haemorrhage, malignant degeneration of the ulcer. Perforated ulcer: definition, epidemiology, classification (Saveliev), clinical picture (cardinal, secondary, general signs), diagnosis. Objectives of surgical treatment. Indications for palliative and radical operations. Atypical perforations of gastroduodenal ulcer. Clinical, diagnostic features. Choice of operating procedure in the surgical treatment of perforated gastroduodenal ulcer. Conservative method of treatment of perforated ulcer (Taylor). 6. Haemorrhagic ulcer: definition, frequency. Classification of upper gastrointestinal bleeding. Pathological anatomy. Pathophysiology of gastric and duodenal haemorrhagic ulcer. Clinical picture, endoscopic diagnosis (Forrest classification) and radiological. Severity of bleeding: classification principles. Principles of haemostatic and replacement therapy. Medical-surgical tactics. Indications for surgical treatment. 7. Differential diagnosis of upper digestive haemorrhages: erosive gastritis, gastric tumours, hiatus hernia, portal hypertension, pulmonary haemorrhage, Mallory-Weiss syndrome, symptomatic ulcers: medicine and stress-related, hepatogenic, atherosclerotic, etc. pathophysiological and clinical features, therapeutic options. Conservative and surgical treatment of ulcerative haemorrhages. Methods of endoscopic haemostasis. 8. Ulcer stenosis: definition, classification. Pathological anatomy. Pathophysiology of ulcerative stenosis. Metabolic, hydroelectrolytic and acid-base changes. Darrow's syndrome. Clinical picture, imaging and laboratory diagnosis. Therapeutic options, indications for surgical treatment. Preoperative preparation and choice of surgical treatment methods. 9. Penetrating ulcer and giant gastroduodenal ulcer: features of the clinical picture, diagnostic methods, indications for surgery, surgical treatment. 10. Malignant degeneration of the ulcer, clinical picture, diagnosis, treatment. 11. Early postoperative complications in gastric and duodenal

Objectives	Units of Content
• to develop their own opinions regarding the importance of the stomach and duodenum in the normal and pathological physiology of the organism, as well as the interactions of the organ with other systems and organs.	ulcer surgery: gastrointestinal anastomosis dehiscence, duodenal abutment dehiscence, extrahepatic bile duct lesions, intra-abdominal haemorrhages, postoperative digestive haemorrhages, anastomosis, acute pancreatitis. Symptomatology, diagnosis, treatment. 12. Zollinger-Ellison syndrome: etiopathogenesis, diagnosis, treatment.
Topic 7. Chest injuries	
• to define the notion of chest trauma; • to know the anatomy of the organs of the thoracic cavity and the mediastinum; • to know the classification of thoracic traumas; • to demonstrate the anatomical interaction of the organs of the thoracic cavity and the mediastinum with other organs of the peritoneal cavity in a normal and pathological case; • to comment on the clinical significance of chest injuries; • to know the laboratory and instrumental diagnostic methods in the detection of traumatic injuries of the thorax; • to motivate the occurrence of complications in case of thoracic trauma and to know the measures of urgent surgical assistance; • to reason the directions and stages of the conservative and surgical treatment of the traumatic injuries of the organs of the thoracic cavity; • to know the classification of haemothorax; • to define the acute conditions leading to acute respiratory failure in thoracic trauma;	1. Chest trauma: general concepts, principles of classification. 2. Rapid lethal chest trauma: classification, diagnosis, treatment. Potentially lethal chest trauma: classification, diagnosis, treatment. 3. Non-lethal chest trauma: classification, diagnosis, treatment. 4. Pneumothorax: etiopathogenesis, classification, diagnosis, medical and surgical management. 5. Haemothorax: aetiology, classification, diagnosis, management. medico-surgical management. 6. Thoracostomy (pleural cavity drainage): indications, methodology. Indications for thoracotomy.

Objectives	Units of Content
• to know the clinical signs, methods of investigation and treatment in heart lesions; • to know the diagnosis and treatment of traumatic shock; • to apply knowledge to other clinical disciplines; • to draw conclusions; • to develop personal opinions regarding the importance of the heart and lungs in the normal and pathological physiology of the organism, as well as the interaction of these organs with other systems in case of trauma.	
Topic 8. Abdominal injuries	
• Define the notion of abdominal trauma; • to know the anatomy of the organs of the abdominal cavity and those located retroperitoneally; • to know the classification of abdominal traumas; • to demonstrate the interaction of the organs of the abdominal and retroperitoneal cavity with other organs of the peritoneal cavity in norm and pathology; • to know the clinical signs, methods of investigation and treatment in lesions of organs with retroperitoneal location (kidneys, pancreas and duodenum); • to comment on the significance of abdominal trauma; • to differentiate abdominal syndromes in abdominal trauma; • to know the laboratory and instrumental diagnostic	1. Abdominal trauma: aetiology, classification, methods of investigation. Particular features of the examination of patients with associated trauma, in shock, cerebral coma, intoxication, etc. 2. Blunt abdominal trauma: aetiology, classification, symptomatology, methods of examination according to patients' haemodynamic. Clinical and paraclinical methods of examination in blunt abdominal trauma. Method of performance of laparocentesis and interpretation of results. 3. Abdominal wall injuries: blunt trauma, non-penetrating wounds, Reilly syndrome, etc. Clinical features, tactics and surgical tactics. 4. Abdominal traumas with lesions of internal organs (diaphragm, stomach, duodenum, pancreas, intestine, liver, spleen): clinical features, diagnosis, surgical tactics. 5. Penetrating abdominal trauma (wounds): aetiology, classification, clinical picture, methods of investigation, treatment. Primary surgical treatment of the wound. The particularities of examination of patients with penetrating wounds: wound assessment, vulnerography, laparoscopy, pyelography, urography, etc.). 6. Gunshot wounds: peculiarities clinical picture, examination methods and surgical tactics. Particulars of surgery, prevention of anaerobic infection.

Objectives	Units of Content
methods, in detecting traumatic injuries of the abdomen; • to reason the occurrence of complications in case of abdominal trauma and to know the measures of emergency surgical assistance; • to explain the directions and stages of the conservative and surgical treatment of traumatic injuries of the abdominal organs; • to know the diagnosis and treatment of traumatic shock; • to apply knowledge from other clinical disciplines; • to draw conclusions; • to develop personal opinions on the importance of abdominal trauma; in the normal and pathological physiology of the organism, as well as in relation to the interactions of the injured organs with other systems and organs in case of trauma.	7. Role of radiological, ultrasonographic and tomographic examination and laboratory examinations in traumatic lesions of the liver. Non-operative treatment of these injuries. 8. Associated trauma: concept, examination features and surgical tactics.
Topic 9. Peritonitis	
• To define the notion of acute primary, secondary and tertiary peritonitis; • to know the anatomy and physiology of the peritoneum; • to know the location of the intra-abdominal organs according to the peritoneal sheets; • to demonstrate the interaction of the peritoneum in case of inflammation of the intra-abdominal organs; • to comment on the clinical significance of acute peritonitis symptoms;	1. Definition. Anatomical and physiological considerations. Classification of peritonitis. Sources of infection of the peritoneal cavity. Pathological changes in acute peritonitis. Pathophysiology of acute peritonitis, disorders of peritoneal absorption, consequences of intestinal paresis, toxaemia, hydroelectrolytic and acid-base disturbances. DIC syndrome and syndrome of poly organic insufficiency. 2. The evolving clinical picture. Diagnosis. Principles of treatment Complex medical and surgical treatment. Particulars of the surgical intervention in peritonitis. Methods of peritoneal cavity drainage, peritoneal dialysis. “Open abdomen” (laparostomy) in diffuse peritonitis: indications, methodology. 3. Role of antibiotic therapy. Therapy of haemodynamic disorders, removal of intoxication and intestinal paresis.

Objectives	Units of Content
• to know the laboratory and instrumental diagnostic methods in the detection of acute peritonitis; • to reason the occurrence of severe complications and systemic changes in case of progression of peritonitis; • to explain the directions and stages of the treatment of acute peritonitis according to its evolutionary phase; • to apply knowledge from other disciplines; • to draw conclusions.	4. Localised peritonitis (subphrenic, subhepatic, fundus of the Douglas pouch, mesoceliac, etc. abscesses). Postoperative peritonitis: Clinical features, prophylaxis. 5. False peritonitis. Specific peritonitis.
Topic 10. Varicose veins of the lower limbs	
• to define the notion of varicose veins of the lower limbs; • to know the anatomy and physiology of the deep and superficial venous system of the lower limb; • to explain the directions and stages of the treatment of varicose veins depending on the evolutionary phase of the disease; • to know the laboratory and instrumental diagnostic methods, as well as the functional signs in assessing the permeability of deep and superficial veins; • to identify clinical signs in case of inflammation and thrombosis of the venous system; • to comment on the clinical significance of the symptoms of acute thrombophlebitis; • to reason the occurrence of complications of systemic changes in case of thrombosis progression;	1. The concept of anatomy and physiology of the venous system. Classification of venous pathology. Varicose disease (primary varicose veins): Etiopathogenesis, pathophysiology, clinical signs and evolution. Diagnosis, clinical functional tests. Exploration of the deep venous system, clinical functional tests. Paraclinical diagnosis: dopplerography, phlebography, phlebomanometry. Conservative and surgical treatment. Indications for surgery. 2. Phlebitis. Etiopathogenesis, pathophysiology. Morphological stages. Clinical forms. Superficial and deep phlebitis. Upper limb phlebitis. Phlebitis of the lower limb. Phlebitis of the vena cava, ileo-femoral segment. Complications of deep phlebitis: pulmonary embolism, venous gangrene, post-thrombotic syndrome. General notions. Therapeutical tactics. 3. Post-thrombotic syndrome: etiopathogenesis, classification, clinical picture, treatment.

Objectives	Units of Content
• to apply knowledge from other clinical disciplines; • to draw conclusions.	
Topic 11. Clinical case presentation	
• To know how to collect history data in surgical patients; • to know the systematic methodology of the general and local abdominal clinical examination; • to know the clinical, laboratory and instrumental diagnostic elements when establishing a positive diagnosis; • to be able to develop the diagnostic-therapeutical algorithm in abdominal surgical pathology; • to know how to formulate structurally the clinical observation sheet (writing the anamnesis, the clinical and paraclinical examinations, the outcomes of specialised committee's meetings, the anaesthesia and operational protocols, as well as the diagnosis and its reasoning; • to know the deontological and ethical rules during patients' investigation and treatment.	1. Presumptive and differential diagnosis. 2. Final diagnosis. 3. Medical and surgical treatment. 4. Clinical evolution and recommendations. 5. Work in the dressing room, operating room.

VIII. PROFESSIONAL COMPETENCES (SPECIFIC (SC) AND CROSS-CUTTING (CC)) AND PURPOSE OF STUDY

Professional skills (specific) (SC)

PC1. Responsible implementation of professional tasks by applying the values and norms of professional ethics, as well as the provisions of the legislation in force.

PC2. Adequate knowledge of the sciences on the organisation and structure of the human body, on physiological functions and behaviour of the human body in various physiological and pathological states, and on the relation between health, and physical and social environment.

PC3. Handling clinical cases by developing diagnostic, treatment and rehabilitation plans in various pathological situations and selecting the appropriate therapeutic procedures, including the provision of emergency care.

PC4. Promotion of a healthy lifestyle, use of preventive and self-care measures.

PC5. Interdisciplinary integration of the physician's work into the team by efficiently using all available resources.

PC6. Carrying out scientific research in the field of health and other branches of science.

PC7. Fostering the prestige of the medical profession and improvement of professional standards.

PC8. Implementation of pedagogical and methodical-didactic activity in higher and vocational medical education institutions.

Cross-cutting skills (CC)

CC1. Autonomy and responsibility while conducting an activity.
CC2. Effective communication and digital skills.
CC3. Interaction skills and social responsibility.
CC4. Ability to interact socially, work in groups with different roles;
CC5. Framing in interdisciplinary projects, extracurricular activities;
CC6. Improving digital skills;
CC7. Development of different learning techniques;
CC8. Selection of digital materials, critical analysis and formulation of conclusions;
CC9. Presentation of individual scientific projects.

Learning outcomes

- ✓ to know the etiological and pathogenetic peculiarities of abdominal and thoracic diseases and traumas;
- ✓ to understand the principles of the evolution of various abdominal pathologies;
- ✓ to know the principles of implementation and to model the basic pathological processes: aetiology, risk factors, pathogenesis and clinical picture of surgical diseases;
- ✓ to know the classifications of surgical pathologies;
- ✓ to understand the basic processes that lead to the complications of surgical diseases;
- ✓ to know the basics and the practical role of clinical, laboratory and instrumental diagnostic methods;
- ✓ to be able to evaluate the place and role of surgery in the clinical training of the medical student;
- ✓ to be competent to use the knowledge and methodology of surgery to explain the nature of physiological or pathological processes;
- ✓ to be able to deduce the possible causes of the development of abdominal and thoracic diseases;
- ✓ to be able to implement the knowledge gained while performing research activity;
- ✓ to be competent to use critically and reliably the scientific information obtained while using the new ICTs.

IX. STUDENTS' INDIVIDUAL WORK

No.	Expected product	Implementation strategies	Evaluation criteria	Deadline
1.	Medication Prescription Sheet:	Read carefully the lecture or textbook material on the topic. Read the topic, and reflect on the proposed topic. Be acquainted with the list of additional information sources on the respective topic. Select additional sources on the topic. Read the whole text carefully and write the essential content. Formulate general ideas and conclusions regarding the importance of the topic.	Ability to extract the essential; interpretive skills; workload.	During the semester
2.	Work with information sources	Read carefully the lecture or textbook material on the topic. Read the topic, and reflect on the proposed topic. Be acquainted with the list of additional information sources on the respective topic. Select additional sources on the topic. Read the whole text carefully and write the essential content. Formulate general ideas and conclusions regarding the importance of the topic.	Ability to extract the essential; interpretive skills; workload.	During the semester
3.	Work with online materials	Online self-assessment. Study online materials available on the department's website. Express opinions in the forum and chat.	Number and duration of website visits, self-assessment results.	During the semester
4.	Development and submission of presentations / portfolios	Select the research topic, Establish the research plan, Establish the deadlines, Establish the components of the PowerPoint project/presentation – theme, purpose, results, conclusions, practical applications, bibliography. Peer review. Teacher review.	The volume of work, the degree of awareness of the essence of the project theme, the degree of scientific argumentation, the quality of conclusions, elements of creativity, the formation of personal attitude, coherence of expression and scientific accuracy,	During the semester

			graphic presentation, oral presentation.	

METHODOLOGICAL SUGGESTIONS FOR TEACHING-LEARNING-ASSESSMENT

- ***Teaching and learning methods***

  In teaching the subject ***Surgical Diseases***, different teaching methods and procedures are used, aiming at the efficient achievement of the objectives of the teaching process. During the practical lectures and seminars, along with the traditional methods (presentation, conversation, synthesis), modern methods are also used (debates, mock conferences, case discussions). During the practical seminars, forms of individual, frontal, group activity, virtual laboratory assignments are used. For a better assimilation of the material, different semiotic systems (scientific language, graphic and computerised language) and teaching materials (tables, diagrams, microphotographs, radiology clichés) are used. During the extracurricular classes and activities, Information Technology Communications, such as PowerPoint presentations and online classes are employed.

- ***Applied teaching strategies/technologies***

  Brainstorming, multi-voting, round table, group interview, case study, creative dispute, focus group technique, portfolio. Virtual practical assignments.

- ***Assessment methods*** *(including how to calculate the final grade)*

  Routine evaluation: frontal and/or individual control by using:

  (a) multiple-choice tests;
  (b) problem solving/exercises;
  (c) case study analysis;
  (d) performing role-plays on the topics discussed;
  (e) tests.

  Final evaluation*:* examination (clinical case presentation, test, oral interview).

The final grade will consist of the average semester mark (0.3), the mark for the practical exam (0.2), the test (0.2) and the mark for the oral exam (0.3).

The annual average grade and marks for all final examination stages (computer-assisted, tests) will be expressed in numbers according to the grading scale (see the table), and the final grade obtained will be expressed in numbers with two decimal places, which will be entered in the mark book.

Means to round the grades during the stages of evaluation

The grid of intermediary grades (annual grade, exams marks)	National grading system	ECTS equivalent
1.00-3.00	**2**	**F**
3.01-4.99	**4**	**FX**
5.00	**5**	**E**

5.01-5.50	**5.5**	
5.51-6.0	**6**	
6.01-6.50	**6.5**	**D**
6.51-7.00	**7**	
7.01-7.50	**7.5**	**C**
7.51-8.00	**8**	
8.01-8.50	**8.5**	**B**
8.51-8.00	**9**	
9.01-9.50	**9.5**	**A**
9.51-10.0	**10**	

In case of exceptional situations (pandemic, etc.) the final grade will be based on the instructions issued by the Didactic and Academic Management Department.

N.B.: *Missing the exams without valid reasons should count as 'absence' and the mark the student will get is zero. The student is entitled to two repeated examinations if they fail the same exam twice*

RECOMMENDED BIBLIOGRAPHY

***A. Mandatory (available)*:**

1. Lectures.
2. Gh. Ghidirim, E. Gutu, Gh. Rojnoveanu. **Surgical pathology,** 2006

***B. Additional (accessible)*:**

1. F. Brunicardi, Dana Andersen, Timothy Billiar, David Dunn, John Hunter, Jeffrey Matthews, Raphael E. Pollock. **Schwartz's Manual of Surgery,** 8th Edition 2006.
2. Michael W. Mulholland. **Greenfield's surgery: scientific principles and practice**, 4th Ed, 2006
3. Courtney M. Townsend R. Daniel Beauchamp B. Mark Evers. **Sabiston Textbook of Surgery**, 18th ed., 2007
4. Robert M. Zollinger, Jr., MD, FACS; E. Christopher Ellison, MD, FACS. **Zollinger's Atlas of Surgical Operations**, 9 th ed., 2010
5. Adam Brooks (Editor), Bryan A. Cotton (Editor), Nigel Tai (Editor), Peter F. Mahoney (Editor). **Emergency Surgery**, 2010
6. Britt, L.D.; Trunkey, Donald D.; Feliciano, David V. (Eds.). **Acute Care Surgery: Principles and Practice**, 2007
7. Qassim Baker, Munther Aldoori. **Guidelines in Clinical Surgery A Trainee Handbook**, 2009
8. Klingensmith, Mary E.; Chen, Li Ern; Glasgow, Sean C.; Goers, Trudie A.; Melby, Spencer J. **Washington Manual of Surgery,The,** 5th Edition 2008
9. Haile T. Debas. **Gastrointestinal Surgery Pathophysiology and Management.** 2004
10. Jeffrey A. Norton, R. Randal Bollinger, Alfred E. Chang, Stephen F. Lowry, Sean J. Mulvihill, Harvey I. Pass, Robert W. Thompson, Michelle Li. **Essential Practice of Surgery Basic Science and Clinical Evidence.** 2003