

V.Ye. KONDRATIUK, V.A. KHOMAZIUK,  
O.A. BYCHKOV, T.G. OSTASHEVSKA,  
I.V. KRASIUK

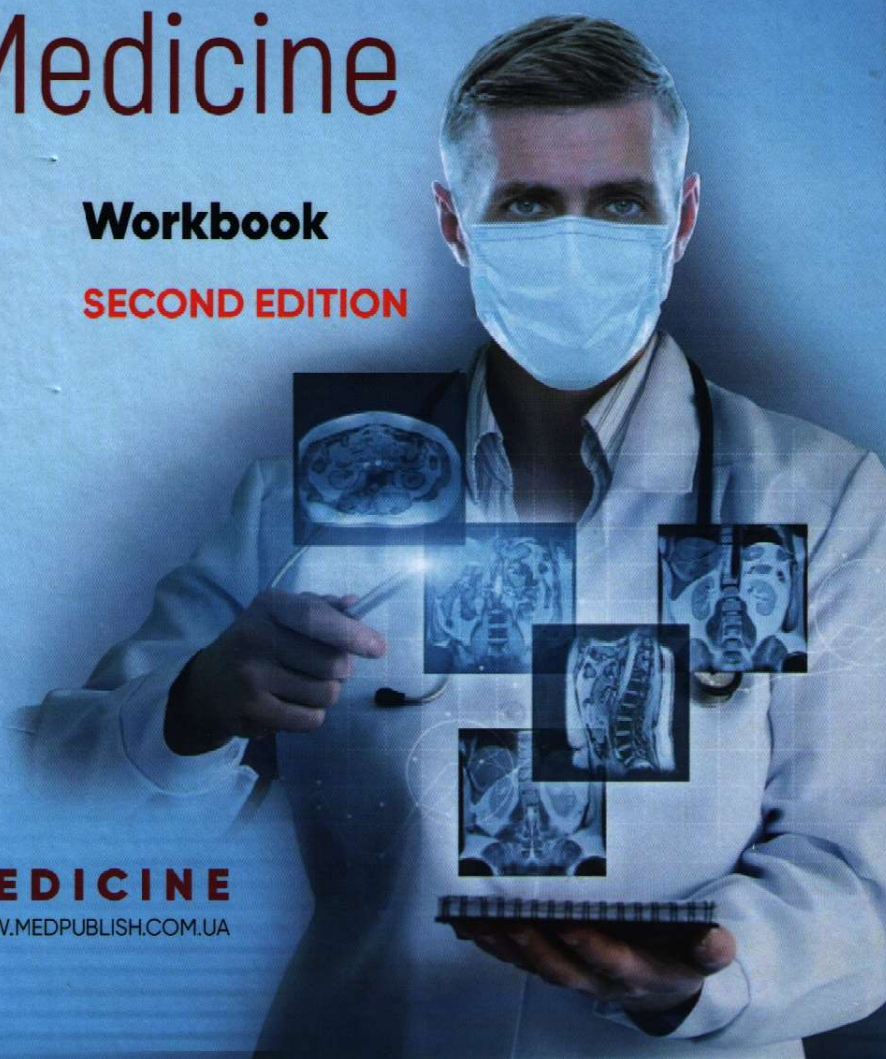
# Propaedeutics of Internal Medicine

**Workbook**

**SECOND EDITION**

**MEDICINE**

[WWW.MEDPUBLISH.COM.UA](http://WWW.MEDPUBLISH.COM.UA)



V.Ye. KONDRATIUK, V.A. KHOMAZIUK,  
O.A. BYCHKOV, T.G. OSTASHEVSKA,  
I.V. KRASIUK

# Propaedeutics of Internal Medicine

## Workbook

Second edition,  
supplemented and revised

The manual contains workbooks on Propaedeutics of Internal Medicine, which are aimed at improving the self-training of English-speaking students of the 3<sup>rd</sup> year to practical classes in the clinic. The structure and contents of the manual are adapted to the requirements of the curriculum of the discipline «Propaedeutics of Internal Medicine» for students of higher medical educational establishments. Structured self-study questions, situational tasks, and quiz test questions will simplify and facilitate students' work on their own. The 2<sup>nd</sup> edition of the clinical manual was supplemented and revised by the teachers of the Department of Propaedeutics of Internal Medicine No. 2 at Bogomolets National Medical University taking into account all suggestions and comments received during recent years from the pedagogical team, students and practicing doctors.

ISBN 978-617-505-919-7



9 786175 059197 >



**MEDICINE**

WWW.MEDPUBLISH.COM.UA

V.Ye. Kondratiuk, V.A. Khomaziuk,  
O.A. Bychkov, T.G. Ostashevskaya,  
I.V. Krasiuk

# Propaedeutics of Internal Medicine

## **Workbook**

Clinical manual for 3<sup>rd</sup> year  
medical students' work on their  
own to prepare for practical  
classes

**SECOND EDITION,**  
supplemented and revised

RECOMMENDED  
by Academic Council of Bogomolets  
National Medical University as a manual  
for students of higher medical educational  
establishments

Kyiv  
**AUS MEDICINE PUBLISHING**  
2022

UDC 616-07(075)  
LBC 51.2:51.9  
P78

*Recommended by Academic Council of Bogomolets National Medical University  
as a manual for students of higher medical educational establishments  
(minutes No 7, 23 February 2022).*

**Authors:**

*V.Ye. Kondratiuk*, Doctor of Medical Sciences, Professor, Head of the Department of Propaedeutics of Internal Medicine No. 2 of Bogomolets National Medical University;

*V.A. Khomaziuk*, Candidate of Medical Sciences, Associate Professor;  
*O.A. Bychkov*, Candidate of Medical Sciences, Associate Professor;  
*T.G. Ostashevskaya*, Candidate of Medical Sciences, Associate Professor;  
*I.V. Krasiuk*, Candidate of Medical Sciences, Associate Professor

The manual contains workbooks on Propaedeutics of Internal Medicine, which are aimed at improving the self-training of English-speaking students of the 3<sup>rd</sup> year to practical classes in the clinic. The structure and contents of the manual are adapted to the requirements of the curriculum of the discipline "Propaedeutics of Internal Medicine" for students of higher medical educational establishments. Structured self-study questions, situational tasks and quiz test questions will simplify and facilitate students' work on their own. The 2<sup>nd</sup> edition of the clinical manual was supplemented and revised by the teachers of the Department of Propaedeutics of Internal Medicine No. 2 at Bogomolets National Medical University taking into account all suggestions and comments received during recent years from the pedagogical team, students and practicing doctors.

UDC 616-07(075)  
LBC 51.2:51.9

**Reviewers:**

*V.V. Batushkin* – Doctor of Medical Sciences, Professor, Head of the Department of Internal and Professional Diseases, Private Higher Educational Establishment "Kyiv Medical University";

*M.A. Stanislavchuk* – Doctor of Medical Sciences, Professor, Head of the Department of Internal Medicine No. 1 of National Progov Memorial Medical University, Vinnytsya

© V.Ye. Kondratiuk, V.A. Khomaziuk,  
O.A. Bychkov, T.G. Ostashevskaya,  
I.V. Krasiuk, 2022  
© AUS Medicine Publishing, design, 2022

ISBN 978-617-505-919-7

## Contents

|                                                                                                                                                                                      |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Abbreviations .....                                                                                                                                                                  | 6        |
| Preface.....                                                                                                                                                                         | 7        |
| <b>MODULE 1. BASIC METHODS OF PATIENTS' EXAMINATION<br/>IN CLINIC OF INTERNAL MEDICINE .....</b>                                                                                     | <b>9</b> |
| Workbook 1. Scheme of case report. Interviewing of a patient.....                                                                                                                    | 9        |
| Workbook 2. General inspection of a patient, diagnostic significance<br>of revealed signs. Inspection of the separate parts of the body:<br>head, neck, trunk, and extremities.....  | 16       |
| Workbook 3. The main complaints of patients with respiratory diseases.<br>Static and dynamic inspection of the chest.<br>Palpation of the chest .....                                | 23       |
| Workbook 4. Percussion of the lungs. Technique of comparative percussion.<br>Technique of topographic percussion.....                                                                | 29       |
| Workbook 5. Auscultation of the lungs. The main breath sounds<br>(vesicular and bronchial breathing).....                                                                            | 36       |
| Workbook 6. Auscultation of the lungs. Adventitious breath sounds (rales,<br>crepitation, and pleural friction sound) .....                                                          | 42       |
| Workbook 7. Instrumental and laboratory methods<br>of respiratory organs examination.....                                                                                            | 48       |
| Workbook 8. Physical methods of cardiovascular system examination.<br>Interviewing and general inspection of the patients<br>with cardiovascular diseases .....                      | 55       |
| Workbook 9. Examination of pulse and blood pressure measurement.....                                                                                                                 | 62       |
| Workbook 10. Inspection and palpation of the heart region. Determination<br>by percussion of the relative and absolute cardiac dullness,<br>borders of the vascular bundle .....     | 69       |
| Workbook 11. Auscultation of the heart. Normal heart sounds,<br>splitting and reduplication of heart sounds, adventitious sounds<br>(mitral valve opening snap, gallop rhythm) ..... | 76       |
| Workbook 12. Auscultation of the heart. Organic and functional heart<br>murmurs.....                                                                                                 | 82       |
| Workbook 13. Interviewing and general inspection of the patients<br>with digestive system diseases. Inspection and superficial<br>palpation of the abdomen .....                     | 89       |

EDUCATIONAL EDITION

**Kondratiuk Vitalii Yevhenovych**  
**Khomaziuk Viktoriia Anastasiivna**  
**Bychkov Oleh Anatoliiovych**  
**Ostashevska Tetiana Genadiivna**  
**Krasiuk Iryna Vasylivna**

## **PROPAEDEUTICS OF INTERNAL MEDICINE**

### **WORKBOOK**

**Clinical manual for 3<sup>rd</sup> year medical students' work on their own  
to prepare for practical classes**

Second edition, supplemented and revised

Authorized for printing 15.08.2022.  
Format 60×90/16. Offset paper.  
Times New Roman typeface. Offset printing.  
15.0 conventional printed sheets.  
Order No.

**All-Ukrainian Specialized Medicine Publishing**

01054, Kyiv, 28 Striletska Street.

Certificate of Record in the State Register of Book Publishers,

Manufacturers and Distributors

DK No. 3595 of 5 October 2009.

Tel.: (044) 581-15-67, 537-63-62.

E-mail: med@society.kiev.ua; <https://www.medpublish.com.ua>

**Пропедевтика внутрішньої медицини: робочий зошит. Навчаль-**  
**ний посібник для підготовки до практичних занять та самостійної**  
**П78 роботи студентів 3-го курсу : навч. посіб. / В.Є. Кондратюк, В.А. Хома-**  
**зюк, О.А. Бичков, Т.Г. Осташевська, І.В. Красюк. – 2-е вид., переробл. і**  
**доповн. – К. : ВСВ “Медицина”, 2022. – 240 с.**  
**ISBN 978-617-505-919-7**

Навчальний посібник містить робочі зошити з пропедевтики внутрішньої медицини, які спрямовані на покращення самостійної підготовки англійських студентів 3-го курсу до практичних занять у клініці. Структура і зміст посібника адаптовані до вимог навчальної програми дисципліни “Пропедевтика внутрішньої медицини” для студентів закладів вищої медичної освіти. Структуровані завдання, ситуаційні задачі й тести дозволяють спростити і полегшити самостійну роботу студентам. Друге видання посібника перероблене і доповнене викладачами кафедри пропедевтики внутрішньої медицини № 2 НМУ імені О.О. Богомольця з урахуванням усіх пропозицій і зауважень, що були отримані протягом останніх років від педагогічного колективу, студентства і практикуючих лікарів.

**УДК 616-07(075)**  
**ББК 51.2;51.9**

## CONTENTS

Preface 8

### **Module 1 Basic methods of patients' examination in clinic of internal medicine**

*Workbook 1.* Scheme of case report. Interviewing of a patient 9

*Workbook 2.* General inspection of a patient, diagnostic significance of revealed signs. Inspection of the separate parts of the body: head, neck, trunk, and extremities 14

*Workbook 3.* The main complaints of patients with respiratory diseases. Static and dynamic inspection of the chest. Palpation of the chest 19

*Workbook 4.* Percussion of the lungs. Technique of comparative percussion. Technique of topographic percussion 24

*Workbook 5.* Auscultation of the lungs. The main breath sounds: vesicular and bronchial 29

*Workbook 6.* Auscultation of the lungs. Adventitious breath sounds (rales, crepitation, and pleural friction sound) 34

*Workbook 7.* Instrumental and laboratory methods of respiratory organs examination 39

*Workbook 8.* Physical methods of cardiovascular system examination. Interviewing and general inspection of the patients with cardiovascular diseases 44

*Workbook 9.* Examination of pulse and blood pressure measurement 49

*Workbook 10.* Inspection and palpation of the heart region. Determination by percussion of the relative and absolute cardiac dullness, borders of the vascular bundle 54

*Workbook 11.* Auscultation of the heart. Normal heart sounds, splitting and reduplication of heart sounds, adventitious sounds (mitral valve opening snap, gallop rhythm) 59

*Workbook 12.* Auscultation of the heart. Organic and functional heart murmurs 64

*Workbook 13.* Interviewing and general inspection of the patients with digestive system diseases. Inspection and superficial palpation of the abdomen 69

*Workbook 14.* Deep sliding methodical palpation of the abdomen 74

*Workbook 15.* Intermediate control of practical skills of the main methods of examination of patients in the clinic of internal medicine 80

*Workbook 16.* Instrumental methods for examination of cardiovascular system. Electrocardiography (ECG): technique of recording and interpreting. ECG signs of ventricular and atrial hypertrophy 82

*Workbook 17.* ECG signs of cardiac arrhythmias associated with altered automaticity and excitability 87

*Workbook 18.* ECG signs of conduction disorders and combined disorders of excitation and conduction 92

### **Module 2 Symptoms and syndromes of internal diseases**

*Workbook 19.* Mitral and aortic valve diseases: the chief symptoms and syndromes, clinical and instrumental methods of examination 97

*Workbook 20.* The chief symptoms and syndromes of essential and secondary arterial hypertension. Hypertensive crisis 104

- Workbook 21.* Ischemic heart disease: the chief symptoms and syndromes of angina pectoris and myocardial infarction 111
- Workbook 22.* The main clinical signs of chronic bronchitis and asthma. Chronic obstructive pulmonary diseases 117
- Workbook 23.* Pneumonia: symptoms and syndromes; clinical, instrumental and laboratory methods of examination. Pneumosclerosis. Lung cancer. The chief symptoms and syndromes of dry pleurisy, pleurisy with effusion 124
- Workbook 24.* Clinical, instrumental and laboratory examination of the patients with chronic gastritis, peptic ulcer disease, and intestine pathology. The chief symptoms and syndromes 134
- Workbook 25.* The chief symptoms and syndromes of biliary diseases: chronic cholecystitis, cholangitis, and cholelithiasis. The main clinical and laboratory signs of chronic hepatitis and liver cirrhosis 141
- Workbook 26.* The chief symptoms and syndromes of renal diseases: acute and chronic glomerulonephritis and pyelonephritis. Chronic kidney disease 147
- Workbook 27.* The chief symptoms and syndromes of anemia. Blood analysis 154

### **Algorithms for Objective Structured Clinical Exam (OSCE)**

- Top 10 tips for clinical examinations 161
- OSCE station.* Measurement of blood pressure 162
- OSCE station.* Physical examination 164
- Comparative percussion of the lungs 164
  - Auscultation of the lungs 165
  - Examination of radial pulse 166
  - Palpation of the apical impulse of the heart 167
  - Determination by percussion of the relative cardiac dullness 168
  - Auscultation of the heart 169
  - Palpation of the sigmoid colon 170
  - Palpation of the cecum 171
  - Palpation of the liver 172
- OSCE station.* Recording of 12-lead electrocardiogram 173
- OSCE station.* Cardiopulmonary resuscitation 175

### **Supplements**

- Scheme of Case Report 176
- Interviewing 176
  - Physical examination 178
- Glasgow Coma Scale 181
- Classification of Overweight and Obesity by BMI, Waist Circumference, and Associated Disease Risks 182
- Cardiopulmonary resuscitation (CPR), basic life support (BLS) 183
- References 186

## ABBREVIATIONS

ACS – acute coronary syndrome  
AF – atrial fibrillation  
AH – arterial hypertension  
AHA – American Heart Association  
ALS – advanced life support  
ALT – alanine transaminase or alanine aminotransferase  
AST – aspartate transaminase or aspartate aminotransferase  
AV – atrioventricular  
BMI – body mass index  
BLS – basic life support  
BP – blood pressure  
CBC – complete blood count  
CK – creatine phosphokinase  
CK-MB – creatine phosphokinase MB isoenzyme  
COPD – chronic obstructive pulmonary disease  
CPR - cardiopulmonary resuscitation  
CT – computed tomography  
CVS – cardiovascular system  
CXR – chest X-ray  
ECG – electrocardiography  
ESR – erythrocyte sedimentation rate  
ESRD – end-stage renal disease  
GFR – glomerular filtration rate  
GI – gastrointestinal  
Hb – hemoglobin  
HDL – high density lipoprotein  
HF – heart failure  
HR – heart rate  
IHD – ischemic heart disease  
IM – intramuscular  
ISH – International Society of Hypertension  
IV – intravenous  
JVP – jugular venous pressure  
LDL – low density lipoprotein  
LDH – lactate dehydrogenase  
LVH – left ventricular hypertrophy  
MI – myocardial infarction  
MRI – magnetic resonance imaging  
NMU – National Medical University  
OSCE – Objective Structured Clinical Exam  
PAC – premature atrial contraction  
PE – physical examination  
PVC – premature ventricular contraction  
RBC – red blood cells or erythrocytes  
SA – sinoatrial  
SC – subcutaneous  
SVT – supraventricular tachycardia  
UTI – urinary tract infection  
VF – ventricular fibrillation  
WBC – white blood cells or leucocytes  
WHO – World Health Organization

## PREFACE

*Propaedeutics of Internal Medicine* is an introductory course of internal medicine. During their first years medical students study the main methods of examination, symptoms of internal diseases, and principles of their diagnosis. This course is given to students after they have studied the fundamentals of medicine, such as anatomy, physiology, biochemistry, etc. During their further courses of internal medicine the students improve their knowledge of all major internal diseases, their differential diagnoses and treatment. Students may take classes in different departments, but a certain sequence in learning is assured.

The skills of history taking and physical examination are central to the practice of clinical medicine. The explosion of medical information in the recent years makes the practice of medicine both simpler and more complex. Various brilliant textbooks and Internet resources have provided students and teachers really unlimited access to the knowledge in internal medicine. We have tried to make assimilation of required information easier. This manual is an accessible workbook for 3rd year medical students who are revising for practical classes at clinic. It provides simple tips about preparation and will be easily understood.

The structure and contents of the manual are adapted to the requirements of the curriculum of the discipline “Propaedeutics of Internal Medicine” for students of higher medical educational establishments. The manual contains 18 workbooks for Module 1 and 9 workbooks for Module 2. Module 1 reviews basic methods of patients’ examination in clinic of internal medicine. Module 2 covers symptoms and syndromes of internal diseases. Workbook for each practical class provides concise description of topic, suggested readings and two variants of structured self-study tasks and quiz test questions for students’ training at home. The convenient design of this edition allows students to make notes, drawings and fill in specific tables.

The 2nd edition of manual has a new section with algorithms for Objective Structured Clinical Exam (OSCE). Sample OSCE stations are provided to prepare students for a new format of undergraduate clinical exams and to help them in development of practical skills. The most commonly encountered OSCE stations are included.

The manual also has the section of useful supplements, including the scheme of case report. The scheme of case report presents the order of history taking and physical examination, it will help students to see the framework they will be using.

The 2<sup>nd</sup> edition of the clinical manual was supplemented and revised by the teachers of the Department of Propaedeutics of Internal Medicine No. 2 at Bogomolets National Medical University taking into account all suggestions and comments received during recent years from the pedagogical team, students and practicing doctors. Workbooks have been widely and effectively used for distance and blended learning during the COVID-19 pandemic. We hope that the workbook will simplify and facilitate students’ work on their own.

## Module 1 Basic methods of patients' examination in clinic of internal medicine

### Workbook 1

#### Topic of practical class 1: "Scheme of case report. Interviewing of a patient"

**Summary of the topic.** Case report: its main parts and rules for recording. The method of history taking, its diagnostic significance, the systematic approach depending on patients' individual, intellectual and psychological particularities. The main parts of history (*anamnesis*): identifying information, chief complaints, history of present illness (*anamnesis morbi*), review of systems (*anamnesis communis*), and life history (*anamnesis vitae*). The role of prominent clinicians in development of interviewing art.

#### Suggested Readings:

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.7-18.
2. Bates' guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.65-108.
3. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P.8-44.
4. Kondratiuk V.Ye., Khomaziuk V.A. Practice in Patient Care at the Therapeutic Department of a Hospital: Workbook. Clinical manual. – Kyiv: AUS Medicine Publishing, 2020. – P.19-33.

#### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course "Propaedeutics of internal medicine PIM № 2". Scheme of case report. Interviewing of a patient. Available at: <https://likar.nmuofficial.com>
2. Medistudents website. OSCE skills. History Taking. Available at: <https://www.medistudents.com/osce-skills/patient-history-taking>

### Variant 1

#### Write answers to the self-study questions:

1. What are the main parts of the interview?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

2. Define the terms 'symptom', 'semeiology', 'diagnosis', 'medical deontology'.

---

---

---

---

---

3. What are the common symptoms of nervous system diseases? Name at least 10 symptoms.

---

---

---

---

---

4. What risk factors are specific for cardiovascular diseases? Name at least 7 factors.

---

---

---

---

---

5. What scheme should physician follow in objective examination of a patient?

---

---

---

---

---

**Quiz Test Questions:**

1. Which method of examination is subjective?

- A. Auscultation.
- B. General inspection.
- C. Interviewing.
- D. Percussion.
- E. Sonography.

2. Pain in renal colic is usually:

- A. boring.
- B. dull.
- C. permanent.
- D. persist for several days.
- E. unilateral.

3. What information should be recorded in the life history of a patient?

- A. Allergies to medications.

- B. Chief complaints.
- C. Date of admission to the hospital.
- D. History of present illness.
- E. Initial symptoms of the disease.

4. Which one of the following is a common symptom of diabetic ketoacidosis?

- A. Chest pain.
- B. Excessive thirst.
- C. Joint pain
- D. Poor night vision.
- E. Weight gain.

5. Information about illnesses of any blood relatives with features similar to the patient's illness is a part of:

- A. family history.
- B. history of present illness.
- C. past medical history.
- D. personal and social history.
- E. review of affected system.

### Variant 2

**Write answers to the self-study questions:**

1. What techniques of objective examination do you know?

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_

2. Define the terms 'sign', 'syndrome', 'iatrogenic', 'risk factors'.

---

---

---

---

---

3. What are the common symptoms of urinary diseases? Name at least 10 symptoms.

---

---

---

---

---

4. What scheme should physician follow in taking life history of a patient?

---

---

---

---

---

5. What information should be recorded in a case report? List the main parts of subjective examination.

---

---

---

---

---

**Quiz Test Questions:**

1. Hypertension, sedentary lifestyle, and obesity are more likely risk factors for:

- A. cardiac disease.
- B. gallbladder disease.
- C. hepatic cancer.
- D. respiratory distress.
- E. brain ischemia.

2. On beginning the process of interviewing, the student should ask first about:

- A. cardiac problems.
- B. chief complaints.
- C. history of present illness.
- D. identifying information.
- E. life history.

3. Black-colored feces usually indicate the presence of:

- A. bacterial infection.
- B. drinking coffee.
- C. drinking tea.
- D. gastric hemorrhage.
- E. hemorrhage from the rectum.

4. A 47-year-old programmer has had severe chest pain for the past 6 days. He seems nervous. Which is an appropriate initial question?

- A. "Do you have a family history of heart disease?"
- B. "Have you been checked by surgeon before?"
- C. "Is the pain worse after deep breath?"
- D. "What do you think is causing the pain?"
- E. "Why do you wait for a week to consult the doctor?"

5. Which common gastrointestinal disorder has been associated with infection with an organism called *Helicobacter pylori*?

- A. Cholecystitis.
- B. Crohn disease.
- C. Duodenal ulcer.
- D. Esophagitis.
- E. Ulcerative colitis.

## NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

## Workbook 2

**Topic of practical class 2: “General inspection of a patient, diagnostic significance of revealed signs. Inspection of the separate parts of the body: head, neck, trunk, and extremities”**

**Summary of the topic.** General inspection. Determination of patient's general condition (types of general condition and their criteria), consciousness (types of disorders), posture of a patient (active, passive, or forced), patient's carriage and gait, their diagnostic significance. Body-build and the main criteria of different constitutional types. The skin, its characteristics (color, elasticity, moisture, temperature, eruptions, pigmentation, scars) and pathologic changes; hair and nails. Inspection of mucous membranes (color, eruptions). Subcutaneous fat (thickness, distribution, and types of obesity), edema. The state of musculoskeletal system. Sequence of lymph nodes palpation and their characteristics (size, symmetry, density, surface, tenderness, mobility, fusing with surrounding tissues and skin). The methods and sequence of examination of head, neck, trunk, and extremities. Diagnostic significance of signs revealed by general inspection.

### Suggested Readings:

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.18-57.
2. Bates' guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.120-123, 180-190, 224-226, 234.
3. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 46-104.
4. Kondratiuk V.Ye., Khomaziuk V.A. Practice in Patient Care at the Therapeutic Department of a Hospital: Workbook. Clinical manual. – Kyiv: AUS Medicine Publishing, 2020. – P.19-33.

### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. General inspection of a patient. Available at: <https://likar.nmuofficial.com>
2. BMI Calculator. Available at: [https://www.nhlbi.nih.gov/health/educational/lose\\_wt/BMI/bmi-m.htm](https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmi-m.htm)
3. LearnDerm website. Available at <https://www.visualdx.com/learnderm/>
4. Medistudents website. OSCE skills. Thyroid Examination. Available at: <https://www.medistudents.com/osce-skills/thyroid-examination>

## Variant 1

**Write answers to the self-study questions:**

1. What is the order of general inspection?
  1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_
  4. \_\_\_\_\_
  5. \_\_\_\_\_

6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_

2. Define the term 'sopor'.

---

---

---

3. Give at least 7 examples of forced postures of the patients with different diseases.

---

---

---

---

---

---

---

4. Define the term 'passive posture of a patient'.

---

---

---

5. Give at least 5 examples of pathologic changes on the patient's skin in different diseases.

---

---

---

---

---

### Quiz Test Questions:

1. The patient lies in bed as he was put before. He is unresponsive. How will you qualify the patient's position?

A. active

B. forced active

- C. forced passive
- D. natural
- E. passive

2. Which nodes are also called Virchow's nodes?

- A. Anterior axillary nodes.
- B. Deep cervical nodes.
- C. Internal mammary nodes.
- D. Epitrochlear nodes.
- E. Supraclavicular nodes.

3. Hirsutism may be a sign of:

- A. beginning baldness.
- B. an endocrine disorder.
- C. a fungal infection.
- D. a bacterial infection.
- E. some local disorders.

4. To palpate inguinal nodes, you should have the patient:

- A. bend over a table and cough.
- B. lie supine, knees slightly flexed.
- C. lie supine, legs extended.
- D. stand and bend backward.
- E. stand and cough vigorously.

5. Breath odors may clue the examiner to certain underlying metabolic conditions. The fruity-scented breath may signify:

- A. uremia.
- B. tuberculosis.
- C. hepatic dysfunction.
- D. diabetic ketoacidosis.
- E. gastric cancer.

## Variant 2

**Write answers to the self-study questions:**

1. What are the main characteristics of the skin?

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_
- 7. \_\_\_\_\_

2. Define the term 'stupor'.

---

---

---

3. Describe at least 7 facial expressions that are specific for definite diseases.

---

---

---

---

---

---

---

4. Define the term 'forced posture of a patient'.

---

---

---

5. Give at least 5 examples of patient's gait in different diseases.

---

---

---

---

---

**Quiz Test Questions:**

1. Low line of the hair on the neck may be a sign of:

- A. beginning baldness.
- B. Shereshevsky-Turner syndrome.
- C. a fungal infection.
- D. a bacterial infection.
- E. some local disorders.

2. Which examination technique should be used first?

- A. Light palpation.
- B. Deep palpation.
- C. Percussion.
- D. Inspection.

### E. Auscultation.

3. Unusual white areas on the skin may be due to:

- A. adrenal disease.
- B. bacterial infection.
- C. Down syndrome.
- D. polycythemia.
- E. vitiligo.

4. The patient lies in bed. He can't change his position, raise his head and hands by himself. How will you qualify the patient's position?

- A. Active.  
B. Forced active.  
C. Forced passive.  
D. Natural.  
E. Passive.

5. The more tender a node, the more likely a/an:

- A. infection.
- B. innocent cause.
- C. leukemia.
- D. malignancy.
- E. metabolic disease.

## NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

### Workbook 3

#### **Topic of practical class 3: “The main complaints of patients with respiratory diseases. Static and dynamic inspection of the chest. Palpation of the chest”**

**Summary of the topic.** Sequence of interviewing and specification of chief complaints, their semiological interpretation. Particularities of taking history of present illness, and life history. Technique of static and dynamic inspection of the chest. Determination of topographic regions and anatomic landmarks on the chest, their diagnostic significance. Physiological and pathological shapes of the chest, their signs. Pathological types of respiration (Cheyne-Stokes’ respiration, Biot’s respiration, Kussmaul respiration, Grocco’s respiration), their characteristics and causes of occurrence. Sequence of chest palpation, determination of vocal (tactile) fremitus and its diagnostic significance.

#### **Suggested Readings:**

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.70-89.
2. Bates’ guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.303-320, 330-336.
3. Macleod’s Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 154-171.

#### **Useful Links:**

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. The main complaints of patients with respiratory diseases. Static and dynamic inspection of the chest. Palpation of the chest. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Respiratory system (official), 2017. Available at: <https://www.youtube.com/watch?v=eeK25NiKOKs&t=25s>
3. Medistudents website. OSCE skills. Respiratory Examination. Available at: <https://www.medistudents.com/osce-skills/respiratory-examination>

### Variant 1

#### **Write answers to the self-study questions:**

1. What are the main symptoms of respiratory diseases? Name at least 7 symptoms.

---

---

---

---

---

2. Define the terms ‘cough’, ‘hemoptysis’.

---

---

---

3. What types of dyspnea do you know? Name at least 3 types.

---

---

---

4. What pathologic variations in respiratory rhythm do you know?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

5. What are possible causes of increased vocal (tactile) fremitus?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

**Quiz Test Questions:**

1. During the attack of bronchial asthma a patient sits or stands, leans against the chair back. He fixes shoulder girdle and in this way decreases dyspnea, makes easier the exhalation. How will you qualify the patient's position?

- A. Active.
- B. Forced active.
- C. Forced passive .
- D. Natural.
- E. Passive.

2. Which of the following is a risk factor for respiratory diseases?

- A. Air pollutants.
- B. Exposure to ultraviolet lights in the office setting.
- C. Hard exercise.
- D. Increased alcohol intake.
- E. Increased dietary salt intake.

3. What term would you use to document a respiratory rate greater than 20 per minute in an adult?

- A. Apnea.
- B. Dyspnea.
- C. Orthopnea.
- D. Platypnea.
- E. Tachypnea.

4. Chest movement can best be seen with:

- A. bright tangential lighting.
- B. daylight from a window.
- C. flashlight in a dark room.
- D. fluorescent ceiling lights.
- E. bright ceiling lights.

5. The degree and level of retractions depends on:

- A. the respiratory rate.
- B. the level of obstruction.
- C. the body temperature.
- D. the angle of the head of the bed.
- E. the room temperature.

## Variant 2

**Write answers to the self-study questions:**

1. What risk factors are specific for respiratory diseases? Name at least 7 factors.

---

---

---

---

---

2. Define the terms 'dyspnea', 'orthopnea'.

---

---

---

---

3. What types of respiration do you know? Name at least 3 types.

---

---

---

4. What abnormal shapes of the chest do you know?

- 1. 

---
- 2. 

---
- 3. 

---
- 4. 

---
- 5. 

---

5. What are possible causes of decreased vocal (tactile) fremitus?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

**Quiz Test Questions:**

1. Mr. X. has cyanotic lips and nail beds. His lips are pursed, and he has nasal flaring. You suspect that he is suffering from pulmonary difficulty. What additional sign would correspond with your impression?

- A. Callus formation on heels.
- B. Clubbing of the fingers.
- C. Graying of the hair.
- D. Swollen toes and ankles.
- E. Decreased turgor of the skin.

2. Which one of the following is considered a risk factor for the development of lung cancer?

- A. Acute respiratory failure.
- B. Emphysema.
- C. Chronic bronchitis.
- D. Lung abscess.
- E. Smoking.

3. The rate and depth of breathing are expected to increase in:

- A. angina pectoris.
- B. metabolic acidosis.
- C. metabolic alkalosis.
- D. myasthenia gravis.
- E. obesity.

4. Pleural pain differs from chest discomfort caused by other conditions in that it is:

- A. precipitated by coughing.
- B. provoked by effort.
- C. usually described as dull in nature.
- D. unrelated to time of day.
- E. provoked by emotional stress.

5. While observing a patient's respirations, you note that, on inspiration, the lower thorax is drawn in and the abdomen protrudes; on expiration, the opposite occurs. This may be described as:

- A. paradoxical breathing.
- B. Biot respiration.
- C. Kussmaul breathing.
- D. abdominal respiration.
- E. hyperpnea.

[illegible]

## Workbook 4

### Topic of practical class 4: “Percussion of the lungs. Technique of comparative percussion. Technique of topographic percussion”

**Summary of the topic.** History of percussion method. The role of percussion in determination of the lungs' condition. Classification of percussion according to purposes, tapping strength, and technique. Different percussion sounds and conditions for their occurrence. The main topographic regions and anatomic landmarks on the chest. The main tasks and technique of comparative percussion. Sequence of percussion, characteristics of percussion sounds and diagnostic significance of obtained results. The causes of dull or flat, dull with a tympanic tone, hyperresonant (bandbox), tympanic, metallic sounds over the lungs.

The main topographic lines on the chest. The main tasks of topographic percussion of the lungs, its technique and sequence. Determining height of the lung apices anteriorly and posteriorly, and width of Kroenig's areas. Sequence of determining lower borders of the lungs, respiratory and passive mobility of pulmonary borders. Traube's space and its diagnostic significance in respiratory pathology.

#### Suggested Readings:

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.89-103.
2. Bates' guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.320-323.
3. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 171-172.

#### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Percussion of the lungs. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Respiratory system (official), 2017. Available at: <https://www.youtube.com/watch?v=eeK25NiKOKs&t=25s>
3. Medistudents website. OSCE skills. Respiratory Examination. Available at: <https://www.medistudents.com/osce-skills/respiratory-examination>

### Variant 1

#### Write answers to the self-study questions:

1. What are the main percussion sounds?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

2. Define the term ‘comparative percussion of the lungs’.

---

---

---

---

---

3. What are possible causes of tympanic percussion sound over affected lung?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

4. Where is height of the lung apices determined anteriorly in a healthy person?

---

---

---

5. What are possible causes of elevation of the lower border of the lungs?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

**Quiz Test Questions:**

1. The dull sound over a part of the lung may be determined in:

- A. bronchial asthma.
- B. cavern.
- C. hydrothorax.
- D. lung emphysema.
- E. pneumothorax.

2. The right and left scapular lines are located:

- A. inferior to each scapula.
- B. lateral to the midaxillary lines.
- C. lateral to the midclavicular lines.
- D. parallel to the vertebral line.
- E. superior to each scapula.

3. The apex of the lung is:

- A. even with the second rib.
- B. higher on the right side.
- C. on the convex diaphragm surface.

- D. 1 cm above the first rib.
- E. 4 cm above the clavicle.

4. The angle of Louis is the junction of the:

- A. acromion process and clavicle.
- B. manubrium and sternum.
- C. second rib and the thoracic spine.
- D. sternum and clavicle.
- E. vertebral column and ribs.

5. In barrel chest there is:

- A. a decrease in the anteroposterior diameter.
- B. an increase in the anteroposterior diameter.
- C. a decrease in the transverse diameter.
- D. an increase in the transverse diameter.
- E. a decrease in both anteroposterior and transverse diameters.

### Variant 2

**Write answers to the self-study questions:**

1. What are the main types of percussion technique?

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_

2. Define the term 'topographic percussion of the lungs'.

---

---

---

---

---

3. What are possible causes of dull percussion sound over affected lung?

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_

4. Where is height of the lung apices determined posteriorly in a healthy person?

---

---

---

5. What are possible causes of lowering of the lower border of the lungs?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

**Quiz Test Questions:**

1. The percussion sound over an empty large long standing cavern is:

- A. absolutely dull.
- B. dull with a tympanic tone.
- C. hyperresonant (bandbox).
- D. resonant.
- E. tympanic with a metallic tone.

2. Percussion of the back should be done with the patient's arms folded in front in order to:

- A. expose maximum lung area.
- B. make the scapulae protrude.
- C. make the sounds higher.
- D. prevent attacks of coughing.
- E. recognize thudlike sounds.

3. Both pleural effusion and lobar pneumonia are characterized by:

- A. dulled tympany heard on percussion.
- B. dullness heard on percussion.
- C. hyperresonance heard on percussion.
- D. resonance heard on percussion.
- E. tympany heard on percussion.

4. The usual landmark at which the examiner percusses for diaphragmatic excursion is:

- A. the midclavicular line.
- B. the midvertebral line.
- C. the scapular line.
- D. the sternum.
- E. the 7th intercostal space.

5. All of the following are accurate descriptors of thoracic anatomy, except:

- A. There are 10 pairs of ribs anteriorly attached to the sternum.
- B. There are 12 pairs of ribs posteriorly attached to the vertebral column.
- C. There are 12 pairs of ribs anteriorly attached directly to the sternum.
- D. The diaphragm and the intercostal muscles are the major muscles of respiration.
- E. The transverse diameter normally exceeds the anterior-posterior diameter.

[illegible]

## Workbook 5

### Topic of practical class 5: “Auscultation of the lungs. The main breath sounds (vesicular and bronchial breathing)”

**Summary of the topic.** History of auscultation method. The rules of using stethoscope. Technique of comparative auscultation of the lungs. The main breath sounds: vesicular and bronchial breathing, their quantitative and qualitative changes, conditions for occurrence. Determining bronchophony, its diagnostic importance.

#### Suggested Readings:

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.103-112.
2. Bates’ guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.323-329, 337-338.
3. Macleod’s Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 172-175.

#### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Auscultation of the lungs: the main breath sounds. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Respiratory system (official), 2017. Available at: <https://www.youtube.com/watch?v=eeK25NiKOKs&t=25s>
3. Medistudents website. OSCE skills. Respiratory Examination. Available at: <https://www.medistudents.com/osce-skills/respiratory-examination>
4. Easy Auscultation website. Lung Sounds. Available at: <https://www.easyauscultation.com/lung-sounds>

## Variant 1

### Write answers to the self-study questions:

1. What are characteristics of the vesicular breathing?
  1. Heard over \_\_\_\_\_
  2. Intensity \_\_\_\_\_
  3. Pitch \_\_\_\_\_
  4. Duration (throughout inspiration and expiration) \_\_\_\_\_
2. What are possible causes of pathological bronchial breathing?
  1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_
3. Define the term ‘harsh breathing’.

---

---

---

4. What are possible causes of physiological weakening of the vesicular breathing?

---

---

---

---

---

5. How is vocal resonance determined?

**Quiz Test Questions:**

1. Changes in blood levels of hydrogen ion concentration, oxygen, and carbon dioxide will stimulate chemoreceptors in the:

- A. hypothalamus.
- B. lung parenchyma and stroma.
- C. medulla oblongata and carotid body.
- D. parietal and visceral pleurae.
- E. tracheobronchial tree and alveoli.

2. Breath sounds normally heard over the trachea are called:

- A. amphoric.
- B. bronchial.
- C. bronchovesicular.
- D. tubular.
- E. vesicular.

3. When auscultating the lungs, listen to the breath sounds:

- A. at the start of inspiration.
- B. during expiration.
- C. during inspiration.
- D. for 30 seconds.
- E. throughout inspiration and expiration.

4. The trauma patient has no auscultated breath sounds in the right lung field. You can hear adequate sounds in the left side. A likely cause of this abnormality could be that the patient:

- A. has a closed head injury.

- B. has broken ribs.
- C. has fluid in the pleural space.
- D. is moaning in severe pain.
- E. is receiving high oxygen flow.

5. During assessment of vocal resonance, you note that sound is intensified, there is a nasal quality to the voice, and e's sound like a's. This is indicative of:

- A. asthma.
- B. bronchial obstruction.
- C. emphysema.
- D. lung consolidation.
- E. pleurisy.

## Variant 2

**Write answers to the self-study questions:**

1. What are characteristics of the bronchial breathing?

1. Heard over \_\_\_\_\_
2. Intensity \_\_\_\_\_
3. Pitch \_\_\_\_\_
4. Duration (throughout inspiration and expiration) \_\_\_\_\_

2. What are possible causes of pathologically decreased vesicular breathing?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

3. Define the term 'amphoric breathing'.

---



---



---

4. What are possible causes of bronchovesicular breathing?

---



---



---



---

---

5. What are bronchophony and egophony?

---

---

---

---

---

**Quiz Test Questions:**

1. Which structure transports air and removes noxious materials?

- A. Acinus.
- B. Acromion.
- C. Alveoli.
- D. Bronchi.
- E. Stroma.

2. The middle lobe of the right lung is best auscultated in the:

- A. anterior chest.
- B. axilla.
- C. midclavicular line.
- D. midvertebral line.
- E. posterior chest.

3. Breath sounds normally auscultated over most of the lung fields are called:

- A. amphoric.
- B. bronchial.
- C. bronchovesicular.
- D. tubular.
- E. vesicular.

4. Changes in clarity and volume of spoken sounds during auscultation of the lungs can help you distinguish:

- A. air from fluid in the pleural cavity.
- B. consolidation from obstruction.
- C. foreign body from mucus.
- D. pulmonary edema from pleurisy.
- E. right from left tracheal deviation.

5. Characteristics of focal consolidation of pulmonary tissue are:

- A. amphoric breathing, intensified bronchophony.
- B. bronchovesicular breathing, tachypnea.
- C. diminished to absent breath sounds.
- D. tachypnea, edema.
- E. tympany heard with percussion, dyspnea.

[illegible]

## Workbook 6

### Topic of practical class 6: “Auscultation of the lungs. Adventitious breath sounds (rales, crepitation, and pleural friction sound)”

**Summary of the topic.** Classification of adventitious breath sounds (rales, crepitation, pleural friction sound). Rales, their types and mechanisms of formation. Diagnostic significance of consonating and non-consonating rales. Conditions for occurrence of crepitation and pleural friction sound. Differential signs of adventitious sounds. Additional auscultative phenomena (Hippocrates’s splash noise, noise of falling drop, noise of “water pipe”), the causes of their occurrence and diagnostic significance.

#### Suggested Readings:

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.112-119.
2. Bates’ guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.323-329, 337-338.
3. Macleod’s Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 172-175.

#### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Auscultation of the lungs. Adventitious breath sounds. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Respiratory system (official), 2017. Available at: <https://www.youtube.com/watch?v=eeK25NiKOKs&t=25s>
3. Medistudents website. OSCE skills. Respiratory Examination. Available at: <https://www.medistudents.com/osce-skills/respiratory-examination>
4. Easy Auscultation website. Lung Sounds. Available at: <https://www.easyauscultation.com/lung-sounds>

### Variant 1

#### Write answers to the self-study questions:

1. What are characteristics of the pleural friction rub?

1. Heard over \_\_\_\_\_
2. Intensity \_\_\_\_\_
3. Pitch \_\_\_\_\_
4. Duration (throughout inspiration and expiration) \_\_\_\_\_

2. What are possible causes of moist rales?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

3. Define the term 'crepitation'.

---

---

---

---

---

4. What are possible causes of wheezes?

---

---

---

---

---

5. How should you differentiate pleural friction rub from fine bubbling rales and crepitation?

---

---

---

---

---

**Quiz Test Questions:**

1. You can hear pleural friction rub:

- A. at the beginning of inspiration.
- B. during inspiration and expiration.
- C. during the height of inspiration.
- D. in the first phase of the expiration.
- E. only during expiration.

2. A wheeze is described as a \_\_\_\_\_ sound.

- A. Continuous, high-pitched, musical.
- B. Crackly, grating, inspiratory.
- C. Rumbling, prolonged, continuous.
- D. Short musical.
- E. Squeaky, high-pitched, discrete.

3. In order to distinguish rales from crepitation, you should auscultate the lungs:

- A. before and after the patient coughs.
- B. first at the lung base, then at the apex.
- C. with the patient inhaling, then exhaling.
- D. with the patient recumbent, then sitting.
- E. with the patient speaking.

4. Respiratory effort usually exhibited by the patient with metabolic acidosis is called:

- A. Biot respiration.
- B. hypopnea.
- C. Kussmaul breathing.
- D. paroxysmal nocturnal dyspnea.
- E. platypnea.

5. Characteristics of lobar consolidation of pulmonary tissue are:

- A. amphoric breathing, medium bubbling rales.
- B. diminished to absent breath sounds.
- C. pathological bronchial breathing, egophony.
- D. vesicular breathing, dry sibilant rales (wheezes).
- E. vesicular breathing, pleural friction rub.

### Variant 2

**Write answers to the self-study questions:**

1. What are characteristics of the crepitation?

- 1. Heard over \_\_\_\_\_
- 2. Intensity \_\_\_\_\_
- 3. Pitch \_\_\_\_\_
- 4. Duration (throughout inspiration and expiration) \_\_\_\_\_

2. What are possible causes of dry rales?

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_

3. Define the term 'pleural friction rub'.

---

---

---

---

---

4. How are rales classified?

---

---

---

---

---

5. What are differential signs of crepitation and fine bubbling rales?

---

---

---

---

---

**Quiz Test Questions:**

1. You can hear crepitation:

- A. at the beginning of inspiration.
- B. during inspiration and expiration.
- C. during the height of inspiration.
- D. in the first phase of the expiration.
- E. only during expiration.

2. Over an empty bronchiectasis of a medium size you can hear:

- A. crepitation.
- B. dry sibilant rales (wheezes).
- C. dry sonorous rales (rhonchi).
- D. fine bubbling rales.
- E. medium bubbling rales.

3. To distinguish between a respiratory friction rub and a cardiac friction rub, ask the patient to:

- A. hold his or her breath.
- B. identify the location of his or her pain.
- C. lay down on his left side.
- D. lean forward.
- E. say “ninety-nine” while you palpate the anterior chest.

4. A musical squeaking noise heard on auscultation of the lungs is called:

- A. crackles.
- B. friction rub.
- C. rales.
- D. rhonchi.
- E. wheezing.

5. The rate and depth of breathing are expected to increase in:

- A. dyspnea.
- B. metabolic alkalosis.
- C. myasthenia gravis.
- D. obesity.
- E. pain.

[illegible]

## Workbook 7

### Topic of practical class 7: “Instrumental and laboratory methods of respiratory organs examination”

**Summary of the topic.** Indications for spirometry and pneumotachymetry, the main parameters in norm and pathology, changes in obstructive and restrictive respiratory insufficiency. Acquaintance with method of bronchoscopy and bronchography, peakflowmetry. Pleural puncture (technique and laboratory study of pleural fluid). Laboratory study of sputum. X-ray examination of respiratory organs, its types and diagnostic significance. Computed tomography of respiratory organs, the main indications for it.

#### Suggested Readings:

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.119-137.
2. Bates’ guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagy, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P. 329, 339-340.
3. Macleod’s Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 175-182.

#### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Instrumental and laboratory methods of respiratory organs examination. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Respiratory system (official), 2017. Available at: <https://www.youtube.com/watch?v=eeK25NiKOKs&t=25s>
3. Medistudents website. OSCE skills. Peak Expiratory Flow Rate (PEFR) Technique. Available at: <https://www.medistudents.com/osce-skills/explaining-the-peak-expiratory-flow-rate-technique>

## Variant 1

### Write answers to the self-study questions:

1. Describe the main indications for spirometry.

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

2. What indices are used to characterize lung ventilation?

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

- \_\_\_\_\_

3. What is pneumotachymetry, peakflowmetry? Describe the main indications for them.

---

---

---

---

---

4. Complete a table of typical changes in sputum:

| Cause of Sputum            | Possible Sputum Characteristics |
|----------------------------|---------------------------------|
| Bacterial infection        |                                 |
| Viral infection            |                                 |
| Chronic infectious disease |                                 |
| Carcinoma                  |                                 |
| Infarction                 |                                 |
| Tuberculous cavity         |                                 |

5. What are the causes and signs of fluid accumulation in the pleural cavity?

---

---

---

---

---

### Quiz Test Questions:

1. Spirography should be used to:

- A. characterize lung ventilation.
- B. confirm the presence of blood in pleural fluid.
- C. detect Curschmann spirals.
- D. distinguish between pneumonia and cancer.
- E. examine malignant tumor cells.

2. Which area of the brain regulates involuntary respiratory muscle movement?

- A. Cerebellum.
- B. Frontal lobe.
- C. Hypothalamus.
- D. Occipital lobe.
- E. Pons.

3. The amount of air maximally expelled after the patient takes a maximal inspiration is the:
- A. expiratory reserve volume.
  - B. residual volume.
  - C. tidal volume.
  - D. total lung capacity.
  - E. vital capacity.
4. Atelectasis is:
- A. chronic obstructive pulmonary disease.
  - B. collapse of lung.
  - C. excessive nonpurulent fluid in pleural space.
  - D. infective inflammation of pleura.
  - E. presence of air in the pleural space.
5. Characteristics of focal consolidation of pulmonary tissue are:
- A. amphoric breathing, intensified bronchophony.
  - B. bronchovesicular breathing, tachypnea.
  - C. diminished to absent breath sounds.
  - D. tachypnea, edema.
  - E. tympany heard with percussion, dyspnea.

### Variant 2

#### Write answers to the self-study questions:

1. Describe the main contraindications for spirometry.

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

2. What is diagnostic importance of bronchoscopy, bronchography?

---

---

---

---

---

3. What are the indications and technique of pleurocentesis?

---

---

---

---

---

4. Describe the main causes of blood in the sputum.

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

5. What is the syndrome of focal consolidation of pulmonary tissue?

---

---

---

---

---

**Quiz Test Questions:**

1. Yellow, green, or rust-colored sputum usually indicates the presence of:

- A. bacterial infection.
- B. carcinoma.
- C. infarction.
- D. pleurisy.
- E. viral infection.

2. The characteristic barrel chest of the older adult is due to a combination of factors, including:

- A. decreased vital capacity.
- B. increased muscular expansion of the chest wall.
- C. increased vital capacity.
- D. less fibrous alveoli.
- E. skeletal changes of aging.

3. What method of instrumental examination should be used for the diagnosis of bronchiectasis?

- A. bronchography.
- B. peakflowmetry.
- C. pleurocentesis.
- D. pneumotachymetry.
- E. spirometry.

4. Platypnea refers to:

- A. dyspnea that increases in the upright position.
- B. dyspnea that increases with inspiration.
- C. dyspnea that increases with exertion.
- D. shortness of breath that is provoked by the supine position.
- E. sudden shortness of breath after a period of sleep.

5. Pneumothorax is:

---

## Workbook 8

### **Topic of practical class 8: “Physical methods of cardiovascular system examination. Interviewing and general inspection of the patients with cardiovascular diseases”**

**Summary of the topic.** Diagnostic significance of the basic physical methods for examination of cardiovascular system (interview, inspection, palpation, percussion and auscultation). Sequence of interviewing and specification of chief complaints, their semiological interpretation. Particularities of taking history of present illness, and life history. General inspection of the patients with cardiovascular diseases. Bedside work of students: examination of patients and recording of case report fragment (*anamnesis*).

#### **Suggested Readings:**

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.142-166.
2. Bates' guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.355-372.
3. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 106-116.

#### **Useful Links:**

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Interviewing and general inspection of the patients with cardiovascular diseases. Available at: <https://likar.nmuofficial.com>
2. Medistudents website. OSCE skills. History Taking. Available at: <https://www.medistudents.com/osce-skills/patient-history-taking>
3. Medistudents website. OSCE skills. Cardiovascular (CVS) Examination. Available at: <https://www.medistudents.com/osce-skills/cardiovascular-examination>

## Variant 1

### **Write answers to the self-study questions:**

1. Describe the main complaints of patients with cardiovascular diseases.

- \_\_\_\_\_

- \_\_\_\_\_

- \_\_\_\_\_

- \_\_\_\_\_

- \_\_\_\_\_

2. What risk factors are specific for cardiovascular diseases? Name at least 7 factors.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

---

---

---

3. What is diagnostic importance of palpitation and escaped beats?

---

---

---

---

---

4. Fill in the table “Cardiovascular causes of chest pain: angina”

| Condition | Location | Quality | Duration | Aggravating and relieving factors | Associated signs |
|-----------|----------|---------|----------|-----------------------------------|------------------|
| Angina    |          |         |          |                                   |                  |

5. Fill in the table “Cardiovascular causes of chest pain: pericarditis”

| Condition    | Location | Quality | Duration | Aggravating and relieving factors | Associated signs |
|--------------|----------|---------|----------|-----------------------------------|------------------|
| Pericarditis |          |         |          |                                   |                  |

**Quiz Test Questions:**

1. Angina pectoris pain differs from chest discomfort caused by other conditions in that it is:

- A. precipitated by coughing.
- B. provoked by effort.
- C. usually described as dull in nature.
- D. unrelated to time of day.
- E. relieved at times with heat.

2. Hypertension, sedentary lifestyle, and obesity are more likely risk factors for:

- A. cardiac disease.
- B. gallbladder disease.

- C. hepatic cancer.
- D. respiratory distress.
- E. brain ischemia.

3. A cardiac condition that may have an infectious or autoimmune etiology is:

- A. infarction.
- B. cor pulmonale.
- C. hypertension.
- D. myocarditis.
- E. atrial septal defect.

4. Which one of the following is **not** a sign of heart failure?

- A. Anasarca.
- B. Ascites.
- C. Cyanosis.
- D. Jaundice.
- E. Swelling of neck veins.

5. Edema associated with heart diseases has such peculiarity:

- A. appear on the face after sleep.
- B. mostly locate in back-sacrum area.
- C. skin over edema has a yellow tint.
- D. skin over edema is warm.
- E. usually appear on legs after exercise.

## Variant 2

**Write answers to the self-study questions:**

1. Describe cardiac dyspnea.

---

---

---

---

---

2. What are the main characteristics of cardiac edema?

- ---
- ---
- ---
- ---
- ---

3. What are the main reasons of cough and hemoptysis in patients with cardiovascular diseases?

---

4. Fill in the table “Cardiovascular causes of chest pain: myocardial infarction”

| Condition             | Location | Quality | Duration | Aggravating and relieving factors | Associated signs |
|-----------------------|----------|---------|----------|-----------------------------------|------------------|
| Myocardial infarction |          |         |          |                                   |                  |

5. Fill in the table “Cardiovascular causes of chest pain: aortic dissection”

| Condition         | Location | Quality | Duration | Aggravating and relieving factors | Associated signs |
|-------------------|----------|---------|----------|-----------------------------------|------------------|
| Aortic dissection |          |         |          |                                   |                  |

**Quiz Test Questions:**

- Orthopnea refers to:
  - dyspnea that increases in the upright position.
  - dyspnea that increases with exertion.
  - sudden shortness of breath after a period of sleep.
  - shortness of breath that is provoked by the supine position.
  - dyspnea that increases with inspiration.
- Which of the following information belongs to the past medical history section related to heart and blood vessel assessment?
  - Adolescent inguinal hernia.
  - Childhood mumps.
  - Past incidence of bee stings.
  - Previous unexplained fever.
  - Allergies to foods.
- When questioning a patient about harmful habits, he tells you that he is “heavy smoker”. What will you ask or say him next?
  - “Are you ready to quit smoking?”

4. Which one of the following is a common symptom of heart failure?
- A. Chest pain.
  - B. Fatigue.
  - C. Joint pain.
  - D. Poor night vision.
  - E. Weight gain.

- A. more to the right and hanging more vertically.
- B. more to the left and lying more horizontally.
- C. riding higher in the chest and pushed anteriorly.
- D. hanging lower in the chest and riding more vertically.
- E. more to the left and hanging more vertically.

[illegible]

## Workbook 9

### Topic of practical class 9: “Examination of pulse and blood pressure measurement”

**Summary of the topic.** Describe the vessels accessible for pulse examination (arterial and venous). The rules and sequence of pulse examination on radial artery. Determination of the main pulse characteristics (symmetry, rhythm, rate, tension, filling, amplitude, and waveform), revealing of pulse deficit, paradoxical pulse, dicrotic pulse. The rules for blood pressure measurement. The main methods of blood pressure measurement. Korotkoff sounds. The basic parameters that determine systolic and diastolic blood pressure. Pulse pressure and mean hemodynamic arterial pressure. Classification of blood pressure levels according to JNC, ESH/ESC Guidelines.

### Suggested Readings:

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.208-222.
2. Bates' guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagy, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.123-132, 373-382, 402.
3. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P.116-126, 139-151.
4. Kondratiuk V.Ye., Khomaziuk V.A. Practice in Patient Care at the Therapeutic Department of a Hospital: Workbook. Clinical manual. – Kyiv: AUS Medicine Publishing, 2020. – P.34-48.

### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Examination of pulse and blood pressure measurement. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. BP Measurement (official), 2017. [https://www.youtube.com/watch?v=dSxlqEGvzCA&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=1](https://www.youtube.com/watch?v=dSxlqEGvzCA&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=1)
3. OSCE-1. Bogomolets National Medical University. Examination of cardiovascular system (official), 2017. [https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=7](https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=7)
4. Medistudents website. OSCE skills. Blood Pressure (BP) Measurement. Available at: <https://www.medistudents.com/osce-skills/blood-pressure-measurement>
5. Medistudents website. OSCE skills. Peripheral Vascular (PVS) Examination. Available at: <https://www.medistudents.com/osce-skills/peripheral-vascular-examination>
6. Blood Pressure Simulator. Easy Auscultation website. Available at <https://www.easyauscultation.com/taking-blood-pressure>

## Variant 1

### Write answers to the self-study questions:

1. What properties of arterial pulse should be examined by palpation?

---

---

---

---

---

---

---

2. Define the term '*pulsus deficiens*'.

---

---

---

---

---

3. What instrumental methods are used for examination of vessels?

---

---

---

---

---

4. Describe the auscultatory technique of blood pressure measurement.

---

---

---

---

---

5. What are the causes of arterial hypertension and hypotension?

**Quiz Test Questions:**

1. The adult's pulse pressure should range from:
  - A. 10 to 20.
  - B. 20 to 25.
  - C. 30 to 40.
  - D. 50 to 60.
  - E. 60 to 70.
  
2. An example of arterial hypertension is one that is caused by:
  - A. glomerulonephritis.
  - B. ventricular septal defect.
  - C. tachycardia.
  - D. mitral valve prolapse.
  - E. forced expiration.
  
3. In young men, coarctation of the aorta should be suspected if you detect:
  - A. a delay between the radial and femoral pulses.
  - B. a simultaneous radial and femoral pulse.
  - C. an absent femoral pulse on the left.
  - D. an absent femoral pulse on the right.
  - E. bilateral absence of femoral pulses.
  
4. Underestimation of blood pressure will occur if the cuff's bladder width covers:
  - A. less than one-half of the upper arm.
  - B. less than 5 inches of the lower arm.
  - C. more than one-half of the lower arm.
  - D. more than two-thirds of the upper arm.
  - E. more than 4 inches of the lower arm.
  
5. The level at which the jugular venous pulse is visible gives an indication of:
  - A. mitral valve efficiency.
  - B. aortic valve efficiency.
  - C. right atrial pressure.
  - D. left ventricular pressure.
  - E. volume depletion.

**Variant 2****Write answers to the self-study questions:**

1. Describe the technique of obtaining the radial pulse.

---

---

---

---

---

2. Define the term '*paradoxical pulse*'.

---

---

---

---

---

3. What are the causes of different pulse and alternating pulse?

---

---

---

---

---

4. Define the terms '*pulse tension*' and '*pulse filling*'.

---

---

---

---

---

5. Describe the methods of measuring venous pressure.

---

---

---

---

---

---

---

**Quiz Test Questions:**

1. The difference in blood pressure readings between the right and the left arms is considered normal up to:

- A. 5 mm Hg.
- B. 10 mm Hg.
- C. 15 mm Hg.
- D. 25 mmHg.
- E. 50 mm Hg.

2. Phlebography is:
- A. pulsation of the vascular wall.
  - B. the recording of the venous pulse.
  - C. the method of studying capillaries.
  - D. the measuring of the venous pulse.
  - E. the measuring of arterial pressure.
3. The characteristics of arterial pulses are directly affected by all of the following except:
- A. the volume of blood ejected.
  - B. peripheral vascular resistance.
  - C. venous valvular competence.
  - D. blood viscosity.
  - E. the total amount of circulating blood.
4. Chronic obstructive pulmonary disease, pericarditis, and pericardial effusion are most often associated with:
- A. alternating pulses.
  - B. bounding vibrations.
  - C. labile pulsations.
  - D. paradoxical pulse.
  - E. water-hammer pulse.
5. The most frequent cause of serious hypertension in children is:
- A. coarctation of the aorta.
  - B. heart disease.
  - C. liver failure.
  - D. renal disease.
  - E. rheumatic fever.

## NOTES

---

---

---

---

---

---

---

---

## Workbook 10

**Topic of practical class 10: “Inspection and palpation of the heart region. Determination by percussion of the relative and absolute cardiac dullness, borders of the vascular bundle”**

**Summary of the topic.** Sequence of heart region inspection. Diagnostic importance of cardiac “hump-back” (lift), pulsations in the region of the heart and neck. Technique of heart region palpation: apical impulse (localization, width, height, strength, resistance, and causes of negative apical impulse); cardiac beat, causes of its occurrence and examination technique; epigastric pulsation of right ventricle, abdominal aorta or liver, hepatojugular reflux; pulsation of ascending aorta and aortic arch; pulmonary trunk pulsation. Presystolic and systolic thrill (“cat’s purr” sign), causes of occurrence.

Relative and absolute cardiac dullness, technique of their determination by percussion (right, upper, and left borders), changes in pathology. Transverse length of the heart and the width of the vascular bundle, their determination by percussion.

### Suggested Readings:

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.166-184.
2. Bates’ guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.382-389, 403.
3. Macleod’s Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 126-127.

### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Inspection and palpation of the heart region. Determination by percussion of the relative and absolute cardiac dullness, borders of the vascular bundle. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Examination of cardiovascular system (official), 2017.  
[https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=7](https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=7)
3. Medistudents website. OSCE skills. Cardiovascular (CVS) Examination. Available at: <https://www.medistudents.com/osce-skills/cardiovascular-examination>

## Variant 1

**Write answers to the self-study questions:**

1. Where is a normal apical impulse found? What properties of the apical impulse are determined?

---

---

---

---

---

---

---

2. What pulsations are examined in the epigastric area?

---

---

---

---

---

---

---

3. Define the terms ‘concentric hypertrophy’, ‘eccentric hypertrophy’, ‘dilation’.

---

---

---

---

---

4. Where are the borders of relative cardiac dullness in a healthy person? Fill in the table:

| Border | Relative cardiac dullness |
|--------|---------------------------|
| Right  |                           |
| Upper  |                           |
| Left   |                           |

5. What is the transverse length of relative cardiac dullness?

---

---

---

**Quiz Test Questions:**

1. A forceful and widely distributed apical impulse may be due to:

- A. decreased cardiac output.
- B. obesity.
- C. hypertrophy of the left ventricle.
- D. hyperventilation.
- E. emphysema of the lungs.

2. The condition in which a patient's heart is either rotated or displaced to the right or is situated as a mirror image of the expected position is called:
- A. amyloidosis.
  - B. coarctation.
  - C. dextrocardia.
  - D. situs inversus.
  - E. ventricular contraction.
3. To estimate the borders of the vascular bundle by percussion, you should begin tapping:
- A. in the 2nd intercostal space.
  - B. at the left sternal border.
  - C. in the 3rd intercostal space.
  - D. from the midsternal line.
  - E. from the anterior axillary line.
4. If the apical impulse is more vigorous than expected, it is called a:
- A. lift.
  - B. thrill.
  - C. bruit.
  - D. murmur.
  - E. rubbing.
5. Heart position can vary depending on body habitus. In a short, stocky individual, you would expect the heart to be located:
- A. more to the right and hanging more vertically.
  - B. more to the left and lying more horizontally.
  - C. riding higher in the chest and pushed anteriorly.
  - D. hanging lower in the chest and riding more vertically.
  - E. more to the left and hanging more vertically.

## Variant 2

### Write answers to the self-study questions:

1. What normal and pathologic pulsations can we see in the precordium?

---

---

---

---

---

2. Describe pathologic variations of the apical impulse properties.

---

---

---

---

---

3. What is the sign of a thrill or “cat’s purr”?

---

---

---

---

---

4. Where are the borders of relative cardiac dullness in a healthy person? Fill in the table:

| Border | Relative cardiac dullness |
|--------|---------------------------|
| Right  |                           |
| Upper  |                           |
| Left   |                           |

5. What are the borders of the vascular bundle?

---

---

---

---

---

**Quiz Test Questions:**

1. Most of the anterior surface of the heart is formed by the:

- A. left atrium.
- B. left ventricle.
- C. right atrium.
- D. right ventricle.
- E. aorta.

2. To estimate the left border of the relative cardiac dullness by percussion, you should begin tapping at the:

- A. anterior axillary line.
- B. left sternal border.
- C. midclavicular line.
- D. midsternal line.
- E. parasternal line.

3. In the adult, the apical impulse should be most visible when the patient is in what position?

- A. Supine.
- B. Upright.

4. A palpable rushing vibration over the base of the heart at the 2nd intercostal space is called a:
  - A. heave.
  - B. lift.
  - C. thrill.
  - D. thrust.
  - E. rubbing.
5. You should start heart percussion at the:
  - A. left anterior axillary line.
  - B. left sternal border.
  - C. right midclavicular line.
  - D. midsternal line.
  - E. right anterior axillary line.

## This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, leaving small margins at the top and bottom. There are no vertical margin lines, and the paper is completely blank except for the lines.

## Workbook 11

**Topic of practical class 11: “Auscultation of the heart. Normal heart sounds, splitting and reduplication of heart sounds, adventitious sounds (mitral valve opening snap, gallop rhythm)”**

**Summary of the topic.** Technique for auscultation of the heart according to traditions of Kyiv therapeutic school. The basic and additional areas for auscultation of the heart. Projections of the heart valves and the best areas for their auscultation. Mechanism of heart sounds formation. The causes of heart sounds increasing and decreasing. Accentuated heart sounds. Changes of the sounds by timbre (clapping, dulled, voiceless, loud, metallic sounds). Splitting and reduplication of heart sounds, the causes of occurrence and time characteristics. Adventitious sounds – mitral valve opening snap (OS), gallop rhythm (presystolic, protodiastolic, mesodiastolic). Methodical particularities of heart auscultation – directly by ear, by stethoscope; in upright or recumbent position of the patient, at rest or after exercise.

### Suggested Readings:

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.185-200.
2. Bates' guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.389-393, 404-407.
3. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 127-135.

### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Auscultation of the heart. Normal heart sounds, splitting and reduplication of heart sounds, adventitious sounds. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Examination of cardiovascular system (official), 2017. [https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=7](https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=7)
3. Medistudents website. OSCE skills. Cardiovascular (CVS) Examination. Available at: <https://www.medistudents.com/osce-skills/cardiovascular-examination>
4. Easy Auscultation website. Heart Sounds. Available at: <https://www.easyauscultation.com/heart-sounds>

## Variant 1

**Write answers to the self-study questions:**

1. What areas for auscultation of the heart do you know?

| N  | Valve | Auscultatory area |
|----|-------|-------------------|
| 1. |       |                   |
| 2. |       |                   |
| 3. |       |                   |

|    |  |  |
|----|--|--|
| 4. |  |  |
| 5. |  |  |

2. What are the components of the first heart sound?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

3. What are the causes for decrease of both heart sounds?

| Extracardiac causes | Intracardiac causes |
|---------------------|---------------------|
|                     |                     |
|                     |                     |
|                     |                     |
|                     |                     |

4. What are the causes for increase of only second heart sound?

| Auscultatory area                                 | Causes |
|---------------------------------------------------|--------|
| 2nd intercostal space to the right of the sternum |        |
|                                                   |        |
| 2nd intercostal space to the left of the sternum  |        |
|                                                   |        |

5. What is the phonocardiographic picture of presystolic gallop rhythm? Draw a scheme, use ECG to specify heart sounds.

### Quiz Test Questions:

1. The major heart sounds are normally created by:
  - A. valves opening.
  - B. valves closing.
  - C. the rapid movement of blood.

- D. rubbing together of the cardiac walls.
- E. ventricles relaxing.

2. A split second heart sound is:

- A. abnormal.
- B. greatest at the peak of inspiration.
- C. heard best after forceful expiration.
- D. supposed to disappear with deep inspiration.
- E. systolic ejection sound.

3. You are listening to a patient's heart in the aortic and pulmonic areas. You notice that S2 is heard better than S1 in both points, but over the aorta it is more intensive. You conclude:

- A. both sounds are normal.
- B. S1 is diminished over the aorta.
- C. S1 is diminished in both areas.
- D. S2 is accented over the aorta.
- E. S2 is diminished over the pulmonary trunk.

4. A fourth heart sound is created by:

- A. atrial contraction.
- B. ventricular contraction.
- C. passive diastolic filling.
- D. regurgitation between the ventricles.
- E. the rapid movement of blood.

5. Which cardiac structure is responsible for the heart's pumping action?

- A. Pericardium.
- B. Epicardium.
- C. Myocardium.
- D. Endocardium.
- E. Cardiac septum.

## Variant 2

**Write answers to the self-study questions:**

1. What areas for auscultation of the heart do you know?

| N  | Valve | Auscultatory area |
|----|-------|-------------------|
| 1. |       |                   |
| 2. |       |                   |
| 3. |       |                   |
| 4. |       |                   |
| 5. |       |                   |

2. What are the components of the second heart sound?

1. \_\_\_\_\_

2. \_\_\_\_\_

3. What are the causes for increase of both heart sounds?

| Extracardiac causes | Intracardiac causes |
|---------------------|---------------------|
|                     |                     |
|                     |                     |
|                     |                     |
|                     |                     |

4. What are the causes for decrease of only first heart sound at the apex?

| Causes | Mechanisms |
|--------|------------|
|        |            |
|        |            |
|        |            |
|        |            |

5. What is the phonocardiographic picture of protodiastolic gallop rhythm? Draw a scheme, use ECG to specify heart sounds.

|  |
|--|
|  |
|--|

### Quiz Test Questions:

- Normal heart sounds are best heard:
  - directly over the semilunar heart valves.
  - over areas where blood flows after it passes through a valve.
  - near the carotid vessels.
  - over the central sternum.
  - directly over the bicuspid heart valves.
- A third heart sound is created by:
  - atrial contraction.
  - regurgitation between the right and left atria.
  - ventricular contraction.
  - diastolic filling.
  - regurgitation between the ventricles.

3. You are listening to a patient's heart in the aortic and pulmonic areas. You notice a sound that results from the closure of the semilunar valves, indicating the end of systole. What is this sound?

- A. S1.  
B. S2.  
C. S3.  
D. S4.  
E. Systolic click.

4. To hear diastolic heart sounds, you should ask patients to:

- A. lie on their backs.
- B. lie on their left sides.
- C. lie on their right sides.
- D. sit up and lean forward.
- E. breath deeply.

5. Contraction of the ventricles causes:

- A. closure of the atrioventricular valves.
- B. closure of the pulmonic and aortic valves.
- C. opening of the auricular septa.
- D. opening of the mitral and tricuspid valves.
- E. closure of the semilunar valves.

## NOTES

[illegible]

## Workbook 12

### Topic of practical class 12: “Auscultation of the heart. Organic and functional heart murmurs”

**Summary of the topic.** The causes and classification of heart murmurs (intracardiac and extracardiac, organic and functional, systolic and diastolic; the murmurs of ejection, filling and regurgitation). The rules for auscultation and characteristics of heart murmurs (relation to systole or diastole, location, transmission, character, duration, intensity, configuration, changes depending on patient's position and exercise). Functional murmurs, their differences from organic murmurs. Extracardiac murmurs: pericardial friction sound, the pleuropericardial friction sound, cardiopulmonary murmurs. Auscultation of the vessels: Traube's doubled sound and Vinogradov-Duroziez doubled murmur over the femoral artery (auscultation technique, the causes and mechanism of formation); venous hum over the jugular veins.

#### Suggested Readings:

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.200-208.
2. Bates' guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.394-399, 408-412.
3. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 127-135.

#### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Auscultation of the heart. Organic and functional heart murmurs. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Examination of cardiovascular system (official), 2017.  
[https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=7](https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=7)
3. Medistudents website. OSCE skills. Cardiovascular (CVS) Examination. Available at: <https://www.medistudents.com/osce-skills/cardiovascular-examination>
4. Easy Auscultation website. Heart Sounds. Available at: <https://www.easyauscultation.com/heart-sounds>

### Variant 1

#### Write answers to the self-study questions:

1. What classification of the heart murmurs do you know?

---

---

---

---

---

2. What are the causes for organic systolic heart murmurs? Fill in the table:

| Auscultatory area | Valve disease |
|-------------------|---------------|
| Heart apex        |               |
|                   |               |
|                   |               |
|                   |               |

3. What are extra cardiac murmurs?

---



---



---



---



---

4. How will you differentiate organic and functional heart murmurs? Fill in the table:

| Characteristics                 | Organic murmurs | Functional murmurs |
|---------------------------------|-----------------|--------------------|
| Relation to systole or diastole |                 |                    |
|                                 |                 |                    |
|                                 |                 |                    |
|                                 |                 |                    |
|                                 |                 |                    |
|                                 |                 |                    |
|                                 |                 |                    |

5. What is the phonocardiographic picture of heart murmur in mitral stenosis? Draw a scheme, use ECG to specify heart sounds and relation of heart murmurs to systole or diastole.

### Quiz Test Questions:

1. An example of a functional heart murmur is one that is caused by:  
A. anemia.

- B. ventricular septal defect.
- C. atrial septal defect.
- D. diastolic filling.
- E. mitral valve prolapse.

2. Mrs. K. is a 25-year-old office manager. She presents with fatigue, malaise, and a rash. On auscultation of her heart, you note systolic murmur at the apex. She reports a recent severe sore throat. You suspect:

- A. angina.
- B. acute rheumatic fever.
- C. cardiac amyloidosis.
- D. aortic sclerosis.
- E. congenital heart disease.

3. The bell of the stethoscope placed at the apex is more useful than the diaphragm for hearing:

- A. filling sound in diastole.
- B. high-pitched murmurs.
- C. presystolic gallops.
- D. systolic ejection sounds.
- E. mitral insufficiency.

4. The auscultation of a three-component machinelike friction rub in a patient with acute chest pain should lead you to suspect:

- A. congestive heart failure.
- B. pericarditis.
- C. endocarditis.
- D. cardiac tamponade.
- E. myocardial infarction.

5. A palpable rushing vibration over the heart apex is called a:

- A. lift.
- B. thrill.
- C. bruit.
- D. murmur.
- E. rubbing.

## Variant 2

**Write answers to the self-study questions:**

1. How is the intensity of heart murmurs graded? Describe 6 grades.

---

---

---

---

---

---

2. What are the causes for organic diastolic heart murmurs? Fill in the table:

| Auscultatory area | Valve disease |
|-------------------|---------------|
| Heart apex        |               |
|                   |               |
|                   |               |
|                   |               |

3. What are the properties of functional (innocent) murmurs?

---



---



---



---



---



---



---

4. How will you differentiate pericardial friction rub from intracardiac murmurs? Fill in the table:

| Characteristics                 | Pericardial friction rub | Intracardiac murmurs |
|---------------------------------|--------------------------|----------------------|
| Relation to systole or diastole |                          |                      |
|                                 |                          |                      |
|                                 |                          |                      |
|                                 |                          |                      |
|                                 |                          |                      |
|                                 |                          |                      |
|                                 |                          |                      |

5. What is the phonocardiographic picture of heart murmur in aortic stenosis? Draw a scheme, use ECG to specify heart sounds and relation of heart murmurs to systole or diastole.

### Quiz Test Questions:

1. Systolic murmur due to stenosed aortic orifice is heard:
  - A. in the second interspace, to the left of the sternum.
  - B. greatest at the peak of inspiration.
  - C. in the second interspace, to the right of the sternum.
  - D. at the heart apex.
  - E. in the axillary area.
  
2. A lift along the left sternal border is most likely the result of:
  - A. aortic stenosis.
  - B. atrial septal defect.
  - C. pulmonary hypertension.
  - D. right ventricular hypertrophy.
  - E. myocarditis.
  
3. You are conducting an examination of patient's heart and blood vessels and auscultate a grade III murmur. The intensity of this murmur is:
  - A. barely audible in quiet room.
  - B. quiet but clearly audible.
  - C. moderately loud.
  - D. loud with palpable thrill.
  - E. very loud without a stethoscope.
  
4. A quiet murmur, without radiation and of medium pitch, is a common variation found in:
  - A. school-age children.
  - B. elderly females.
  - C. middle-age males.
  - D. older adults.
  - E. obese patients.
  
5. A condition that is usually silent and painless until a stroke, dysrhythmia, or heart failure develops is:
  - A. mitral insufficiency.
  - B. pericarditis.
  - C. angina.
  - D. cardiomyopathy.
  - E. cor pulmonale.

### NOTES

---

---

---

---

---

---

---

## Workbook 13

### **Topic of practical class 13: “Interviewing and general inspection of the patients with digestive system diseases. Inspection and superficial palpation of the abdomen”**

**Summary of the topic.** Sequence of interviewing and specification of chief complaints in patients with digestive system diseases. Particularities of taking history of present illness, and life history. Changes of patients’ appearance in different diseases of digestive system. Inspection of the abdomen (shape, size, symmetry, umbilicus, participation in breathing, visible pulsation and peristalsis, pigmentations, scars, eruptions, scratches, telangiectasias, hernia, and subcutaneous veins). Topographic zones and lines on the anterior abdominal wall. Tasks and technique of superficial palpation of the abdomen (tenderness, muscle resistance; hernia or separation of muscles, tumours; Shchetkin-Blumberg sign, Mendel sign). Methods of revealing ascites (inspection, percussion, palpation).

#### **Suggested Readings:**

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.309-338.
2. Bates’ guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.453-464, 470-475, 488-498.
3. Macleod’s Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 184-201, 204-212.

#### **Useful Links:**

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Interviewing and general inspection of the patients with digestive system diseases. Inspection and superficial palpation of the abdomen. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Examination of gastrointestinal system (official), 2017. Available at: [https://www.youtube.com/watch?v=K0RN4NM6IbY&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=8](https://www.youtube.com/watch?v=K0RN4NM6IbY&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=8)
3. Medistudents website. OSCE skills. Abdominal (GI) Examination. Available at: <https://www.medistudents.com/osce-skills/abdominal-examination>

### **Variant 1**

#### **Write answers to the self-study questions:**

1. What complaints are typical for diseases of digestive system? Name at least 10 symptoms.

---

---

---

---

---

---

---

2. What techniques are used for objective examination of the digestive system?

- General inspection
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

3. What are the signs of gastrointestinal hemorrhage?

---

---

---

---

---

4. How can you differentiate obesity, meteorism and ascites by means of inspection, percussion and palpation of the abdomen?

---

---

---

---

---

---

---

---

5. Describe Shchetkin-Blumberg sign and explain its diagnostic importance.

---

---

---

---

---

**Quiz Test Questions:**

1. Inspection of the abdomen should begin with the patient supine and the examiner:

- A. seated on the patient's left.
- B. seated on the patient's right.

- C. standing at the foot of the bed.
  - D. standing at the patient's left.
  - E. walking around the bed.
2. What technique is particularly useful in identifying muscular resistance and areas of tenderness?
- A. Bimanual palpation.
  - B. Deep palpation.
  - C. Light palpation.
  - D. Moderate palpation.
  - E. Percussion.
3. Black-colored feces usually indicate the presence of:
- A. bacterial infection.
  - B. drinking cacao.
  - C. drinking coffee.
  - D. gastric hemorrhage.
  - E. hemorrhage from the rectum.
4. A common abdominal wall defect that is usually an inconsequential finding is a/an:
- A. asymmetric distension.
  - B. diastasis recti.
  - C. laterally displaced umbilicus.
  - D. small inguinal hernia.
  - E. umbilical hernia.
5. When auscultating the abdomen, what finding would indicate collateral circulation between the portal and systemic venous systems?
- A. Arterial bruit.
  - B. Borborygmi.
  - C. Gastric rumbling.
  - D. Renal hyperresonance.
  - E. Venous hum.

## Variant 2

### Write answers to the self-study questions:

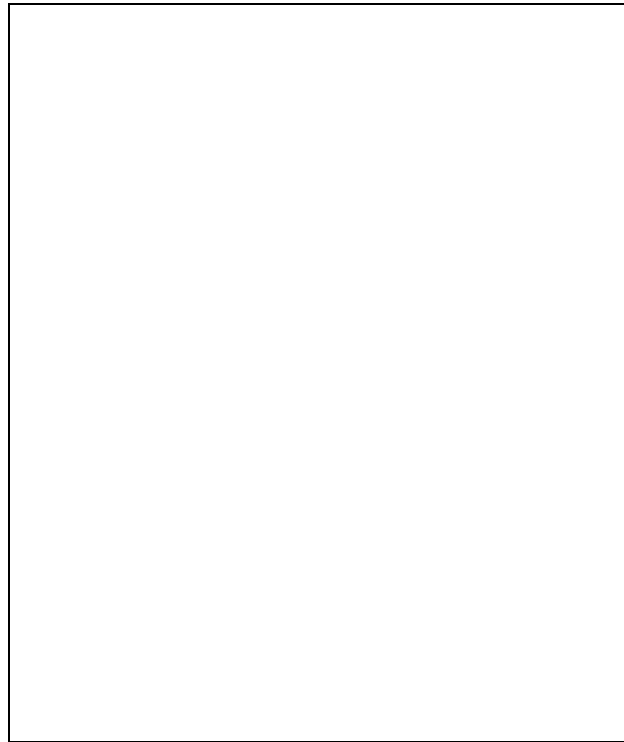
1. What are the main parts of the interview in patients with digestive system diseases?
- 1. \_\_\_\_\_
  - 2. \_\_\_\_\_
  - 3. \_\_\_\_\_
  - 4. \_\_\_\_\_
  - 5. \_\_\_\_\_
2. What risk factors are specific for diseases of digestive system? Name at least 7 factors.
- \_\_\_\_\_
- \_\_\_\_\_

---

---

---

3. Draw a layout of the nine topographic zones on the anterior abdominal wall.



4. How can you diagnose peritonitis by means of inspection, auscultation and superficial palpation of the abdomen?

---

---

---

---

---

---

---

5. Describe ‘fluctuation’ sign and explain its diagnostic importance.

---

---

---

---

---

### Quiz Test Questions:

1. Visible intestinal peristalsis may indicate:
  - A. aortic aneurysm.
  - B. increased pulse pressure of aorta.
  - C. intestinal obstruction.
  - D. meteorism.
  - E. normal digestion.
  
2. When examining a patient with tense abdominal musculature, a helpful technique is to have the patient:
  - A. flex his or her knees.
  - B. hold his or her breath.
  - C. raise his or her head off the pillow.
  - D. sit upright.
  - E. turn to his right or left side.
  
3. What condition is associated with purplish striae?
  - A. Ascites.
  - B. Cushing disease.
  - C. Intra-abdominal bleeding.
  - D. Liver cirrhosis.
  - E. Recent pregnancy.
  
4. Borborygmi is:
  - A. absence of all bowel sounds.
  - B. faint and infrequent bowel sounds.
  - C. loud, prolonged gurgling bowel sounds.
  - D. throbbing-like bowel sounds.
  - E. tympanic bowel sounds.
  
5. Which common gastrointestinal disorder has been associated with infection with an organism called *Helicobacter pylori*?
  - A. Cholecystitis.
  - B. Crohn disease.
  - C. Duodenal ulcer.
  - D. Esophagitis.
  - E. Ulcerative colitis.

### NOTES

---

---

---

---

---

---

---

## Workbook 14

### Topic of practical class № 14: “Deep sliding methodical palpation of the abdomen”

**Summary of the topic.** The role of prominent scientists in elaboration of the abdominal palpation's technique. Projections of different gastrointestinal system's departments on the anterior abdominal wall. Sequence of deep sliding methodical palpation of the abdomen according to Obratzov and Strazhesko: the normal parameters of sigmoid, cecum, ileum, ascending and descending colons, and transverse colon. Methods for outlining the inferior border of the stomach (percussion, palpation, stethacoustic, by splashing sound).

Determination of the liver size according to Obratzov and Kurlov methods. The causes of liver enlargement or diminishing. Technique of liver palpation. The normal liver characteristics (liver lower edge, consistency, surface, painfulness) and their possible changes in pathology. Technique of spleen percussion and the main causes of spleen enlargement. The rules for spleen palpation. Diagnostic significance of Pasternatsky's sign. Palpation of the kidneys in supine and upright positions.

### Suggested Readings:

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P. 338-347, 385-389.
2. Bates' guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.474-487, 499-504.
3. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 199-204.

### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Deep sliding methodical palpation of the abdomen. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Examination of gastrointestinal system (official), 2017. Available at: [https://www.youtube.com/watch?v=K0RN4NM6IbY&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=8](https://www.youtube.com/watch?v=K0RN4NM6IbY&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=8)
3. Medistudents website. OSCE skills. Abdominal (GI) Examination. Available at: <https://www.medistudents.com/osce-skills/abdominal-examination>

## Variant 1

### Write answers to the self-study questions:

1. What are the rules for deep palpation of the abdomen? Describe the posture of the patient and the physician, position of examiner's hands, use of breathing.

---

---

---

---

---

2. What is the recommended sequence of deep palpation? Fill in the table:

| N   | Organ            | Palpation by one hand or bimanual |
|-----|------------------|-----------------------------------|
| 1.  | Sigmoid          | By one hand                       |
| 2.  |                  |                                   |
| 3.  |                  |                                   |
| 4.  |                  |                                   |
| 5.  |                  |                                   |
| 6.  |                  |                                   |
| 7.  |                  |                                   |
| 8.  | Transverse colon | With both hands simultaneously    |
| 9.  |                  |                                   |
| 10. |                  |                                   |
| 11. |                  |                                   |
| 12. |                  |                                   |
| 13. |                  |                                   |

3. To determine the inferior border of the stomach you can use:

1. Palpation;
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

4. Describe the properties of the normal sigmoid which are determined by palpation.

---



---



---

5. Where are the lower borders of the liver determined in a healthy person?

| Topographic line        | Lower border of the liver |
|-------------------------|---------------------------|
| Right anterior axillary |                           |
|                         |                           |

|                  |                           |
|------------------|---------------------------|
| Topographic line | Lower border of the liver |
|                  |                           |
|                  |                           |
|                  |                           |

6. Where are the borders of the spleen determined in a healthy person?

|                      |                       |
|----------------------|-----------------------|
| Border / dimension   | Topographic line, rib |
| Upper                |                       |
| Lower                |                       |
| Transverse dimension | _____ cm              |

7. What is the technique of deep palpation of the spleen? Describe the posture of the patient and the physician, position of examiner's hands, use of breathing.

---



---



---



---



---



---



---

### Quiz Test Questions:

1. Deep palpation of the abdomen should begin with the patient supine and the examiner:

- A. seated on the patient's left.
- B. seated on the patient's right.
- C. standing at the foot of the bed.
- D. standing at the patient's left.
- E. walking around the bed.

2. Which structure is palpated in the left iliac region of the abdomen?

- A. Bladder.
- B. Cecum.
- C. Gallbladder.
- D. Stomach.
- E. Sigmoid.

3. Which of the following is more commonly palpable in a healthy patient?

- A. Gallbladder.
- B. Left kidney.
- C. Liver.

- D. Right kidney.
- E. Spleen.

4. The upper edge of the liver should be detected by percussion along the right midclavicular line at:

- A. fifth rib.
- B. sixth intercostal space.
- C. seventh intercostal space.
- D. eighth rib.
- E. tenth intercostal space.

5. When percussing a spleen, distorted sounds are most likely caused by:

- A. colonic air.
- B. distended bladder.
- C. empty stomach.
- D. renal hyperresonance.
- E. solid mass.

### Variant 2

**Write answers to the self-study questions:**

1. What are the techniques of deep palpation of the abdomen? Describe four steps.

---

---

---

---

---

---

---

---

2. Specify the sequence of deep sliding methodical palpation. Fill in the table:

| No | Organ             | Topographic area |
|----|-------------------|------------------|
| 1. | Sigmoid           | Left iliac       |
| 2. |                   |                  |
| 3. |                   |                  |
| 4. |                   |                  |
| 5. |                   |                  |
| 6. |                   |                  |
| 7. | Stomach, duodenum |                  |
| 8. |                   |                  |

|     |  |  |
|-----|--|--|
| 9.  |  |  |
| 10. |  |  |
| 11. |  |  |
| 12. |  |  |
| 13. |  |  |

3. Where can you determine the inferior border of the stomach in healthy subjects? Define the terms 'gastroptosis', 'pylorostenosis'.

---



---



---



---

4. Describe the properties of the normal cecum which are determined by palpation.

---



---



---

5. Where are the upper borders of the liver determined in a healthy person?

| Topographic line  | Upper border of the liver |
|-------------------|---------------------------|
| Right parasternal |                           |
|                   |                           |
|                   |                           |

6. Where are the borders of the spleen determined in a healthy person?

| Border / dimension | Rib, topographic line, |
|--------------------|------------------------|
| Anterior           |                        |
| Posterior          |                        |
| Long axis size     | _____ cm               |

7. What is the technique of deep palpation of the liver? Describe the posture of the patient and the physician, position of examiner's hands, use of breathing.

---



---



---



---

---

---

---

**Quiz Test Questions:**

1. Which of the following is least likely palpable in a healthy adult?
  - A. Appendix.
  - B. Cecum.
  - C. Ileum.
  - D. Sigmoid.
  - E. Transverse colon.
  
2. Which structure is located in the hypogastric region of the abdomen?
  - A. Bladder.
  - B. Cecum.
  - C. Gallbladder.
  - D. Pancreas.
  - E. Stomach.
  
3. Percussion at the right midclavicular line, below the umbilicus, and continuing upward is the correct technique for locating the:
  - A. descending aorta.
  - B. lower liver border.
  - C. lower stomach border.
  - D. medial border of the spleen.
  - E. upper right kidney ridge.
  
4. The distance between the upper and lower borders of liver dullness in the right parasternal line is normally:
  - A. 6-8 cm.
  - B. 7-9 cm.
  - C. 8-10 cm.
  - D. 9-11 cm.
  - E. 10-12 cm.
  
5. A palpation technique used to assess a floating mass is called:
  - A. ballottement.
  - B. bimanual.
  - C. iliopsoas test.
  - D. obturator test.
  - E. rebound test.

**NOTES**

---

---

---

---

## Workbook 15

### **Topic of practical class № 15: “Intermediate control of practical skills of the main methods of examination of patients in the clinic of internal medicine”**

**Summary of the topic.** Intermediate knowledge control of topics 1-14 and checking of practical skills. Students should pay particular attention to the practical skills that will be included in the Objective Structured Clinical Exam (OSCE). For more details about algorithms for OSCE turn to Supplements at the end of this book.

#### **Suggested Readings:**

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – 417 p.
2. Bates’ guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – 1034 p.
3. Macleod’s Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – 472 p.

#### **Useful Links:**

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Respiratory system (official), 2017. <https://www.youtube.com/watch?v=eeK25NiKOKs&t=25s>
3. OSCE-1. Bogomolets National Medical University. Examination of cardiovascular system (official), 2017. [https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=7](https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=7)
4. OSCE-1. Bogomolets National Medical University. BP Measurement (official), 2017. [https://www.youtube.com/watch?v=dSxlqEGvzCA&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=1](https://www.youtube.com/watch?v=dSxlqEGvzCA&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=1)
5. OSCE-1. Bogomolets National Medical University. Examination of gastrointestinal system (official), 2017. [https://www.youtube.com/watch?v=K0RN4NM6IbY&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=8](https://www.youtube.com/watch?v=K0RN4NM6IbY&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=8)
6. Medistudents website. OSCE skills. Available at: <https://www.medistudents.com/osce-skills#other>

#### **The list of practical skills that a student must acquire:**

1. To interview the patient. To make a conclusion about the received anamnestic data.
2. To interview the patient with lung pathology. Identify the main symptoms.
3. To interview the patient with pathology of the cardiovascular system. Identify the main symptoms.
4. To interview the patient with pathology of the gastrointestinal tract. Identify the main symptoms.
5. To conduct general inspection of the patient. Identify main symptoms.
6. To examine the patient’s head and neck. To determine the clinical value of symptoms.
7. To inspect the trunk and extremities of the patient. To determine the clinical value of symptoms.
8. To examine the chest of patient with bronchopulmonary pathology, to evaluate the static signs.
9. To examine the chest of patient with bronchopulmonary pathology, to evaluate the dynamic signs.

10. To examine the heart region, determine the clinical value of the symptoms.
11. To examine the abdomen, determine the clinical value of symptoms.
12. To conduct palpation of the chest, to determine the clinical value of symptoms.
13. To conduct palpation of the lymph nodes, to evaluate the results.
14. To carry out palpation of thyroid gland, to evaluate the received data.
15. To conduct palpation of the pulse, to determine the clinical value of symptoms.
16. To carry out palpation of the heart region, to determine the clinical value of symptoms.
17. To conduct superficial palpation of abdomen, to determine the clinical value of symptoms.
18. To carry out palpation of the sigmoid colon, to determine the clinical value of symptoms.
19. To carry out palpation of the caecum, to determine the clinical value of the symptoms.
20. To conduct palpation of the ascending colon, to determine the clinical value of the symptoms.
21. To carry out palpation of the descending colon, determine the clinical value of the symptoms.
22. To carry out palpation of the transverse colon, determine the clinical value of the symptoms.
23. To conduct palpation of the liver, to determine the clinical value of the symptoms.
24. To conduct palpation of the spleen, to determine the diagnostic value of the symptoms.
25. To carry out palpation and percussion of the kidneys, to determine the diagnostic value of the symptoms.
26. To determine the lower border of the stomach, evaluate the obtained data.
27. To determine the presence of fluid in the abdominal cavity, to give a clinical evaluation.
28. To measure blood pressure at the upper extremities, evaluate the obtained data.
29. To carry out measurements of arterial pressure on the lower extremities, to evaluate the obtained data.
30. To conduct comparative percussion of the lungs and determine the clinical value of symptoms.
31. To conduct topographic percussion of the lungs and determine the diagnostic value of symptoms.
32. To determine the respiratory mobility of the lower lung edge, to evaluate the diagnostic value of the symptoms.
33. To conduct percussion of the heart, to determine the borders of the heart relative dullness, to give a clinical evaluation.
34. To conduct percussion of the heart, to determine the borders of the heart absolute dullness, to give a clinical evaluation.
35. To determine the width of the vascular bundle by the percussion method, to evaluate the obtained data.
36. To determine by percussion borders of the liver, to evaluate the diagnostic value of symptoms.
37. To determine by percussion borders of the spleen, to give a clinical evaluation.
38. To carry out auscultation of lungs, to determine quantitative and qualitative changes of breathing, to give a clinical evaluation.
39. To carry out auscultation of lungs, to define adventitious breath sounds, to give clinical evaluation.
40. To check bronchophony, to give clinical evaluation.
41. To carry out auscultation of the arteries, to determine the diagnostic value of the symptoms.
42. To conduct auscultation of the heart, to determine changes in its sounds, to give a clinical evaluation.
43. To conduct auscultation of the heart, to determine the diagnostic value of heart murmurs.

## NOTES

---

---

---

## Workbook 16

**Topic of practical class 16: “Instrumental methods for examination of cardiovascular system. Electrocardiography (ECG): technique of recording and interpreting. ECG signs of ventricular and atrial hypertrophy”**

**Summary of the topic.** Clinical and diagnostic importance of ECG. Biophysical and physiological base of method. Pacemakers’ and conductive system structure and function. The basic and additional impulse transit ways. ECG registration technique: standard, augmented and precordial leads. Basic ECG elements: the meaning of waves duration and amplitude, intervals and segments in normal condition. Algorithm and method of ECG interpretation. ECG signs of ventricular and atrial hypertrophy.

Echocardiography: diagnostic significance and technique. The prominent echocardiographic parameters: the size and volume of the cavities, ejection fraction, left ventricular posterior wall thickness and interventricular septum thickness. Echo-Doppler study of heart and vessels. Phlebography, phonocardiography: significance of the methods for clinic, technique.

### Suggested Readings:

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.227-255, 288-306.
2. Bates’ guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.351-352, 400-401.
3. Macleod’s Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 136-139.

### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Instrumental methods for examination of cardiovascular system. Electrocardiography (ECG): technique of recording and interpreting. ECG signs of atrial and ventricular hypertrophy. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Recording and analysis of ECG (official), 2017.  
[https://www.youtube.com/watch?v=1RUUpDZliFC8&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=3](https://www.youtube.com/watch?v=1RUUpDZliFC8&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=3)
3. Medistudents website. OSCE skills. Electrocardiography (ECG). Available at: <https://www.medistudents.com/electrocardiography-ecg>

## Variant 1

### Write answers to the self-study questions

1. What is clinical importance of electrocardiography?

---

---

---

---

---

2. Where is active electrode placed for recording of precordial leads? Fill in the table:

|                |  |
|----------------|--|
| V <sub>1</sub> |  |
| V <sub>2</sub> |  |
| V <sub>3</sub> |  |
| V <sub>4</sub> |  |
| V <sub>5</sub> |  |
| V <sub>6</sub> |  |

3. Describe normal intervals of ECG. Fill in the table:

|     |  |
|-----|--|
| PQ  |  |
| QRS |  |
| QT  |  |

4. What ECG changes may indicate ischemia?

---



---



---



---



---

5. What are ECG criteria of ventricular hypertrophy? Fill in the table:

|                               |  |
|-------------------------------|--|
| Left ventricular hypertrophy  |  |
| Right ventricular hypertrophy |  |

**Quiz Test Questions:**

1. Electrical activity recorded by the ECG tracing that denotes the spread of the stimulus through the atria is the:
  - A. *P* wave.
  - B. *PR* interval.
  - C. *QRS* complex.
  - D. *ST* segment.
  - E. *QT* interval.
2. Purkinje fibers are located in the:
  - A. sinoatrial node.
  - B. atrioventricular node.
  - C. myocardium.
  - D. aortic arch.
  - E. left atria.
3. The wave of ventricular depolarization spreads:
  - A. from endocardium to epicardium.
  - B. from epicardium to endocardium.
  - C. along the anatomic axis of the heart.
  - D. from SA node to the ventricles.
  - E. through conductive system of the heart.
4. The impulses spread from SA node through the atria at a rate of:
  - A. 5-10 cm/s.
  - B. 10-20 cm/s.
  - C. 30-50 cm/s.
  - D. 50-75 cm/s.
  - E. 1 m/s.
5. Anterior myocardial infarction produces ECG changes in the leads:
  - A. I, II, aVF, V<sub>4</sub>
  - B. I, III, aVL, V<sub>5</sub>
  - C. I, aVR, V<sub>6</sub>
  - D. I, aVL, V<sub>3</sub>
  - E. III, aVF, V<sub>3</sub>

### Variant 2

#### Write answers to the self-study questions:

1. What is clinical importance of echocardiography?

---

---

---

---

---

2. Describe normal waves and intervals of ECG. Fill in the table:

|               |  |
|---------------|--|
| <i>P</i> wave |  |
| <i>PQ</i>     |  |
| <i>Q</i>      |  |
| <i>T</i>      |  |
| <i>QT</i>     |  |

3. What are ECG signs of atrial enlargement? Fill in the table:

|              |  |
|--------------|--|
| Left atrium  |  |
| Right atrium |  |

4. Where are active electrodes placed for recording of limb leads? Fill in the table:

|     |  |
|-----|--|
| I   |  |
| II  |  |
| III |  |
| aVR |  |
| aVL |  |
| aVF |  |

5. What is the order of ECG interpreting? Name at least 10 steps.

---



---



---



---



---

### Quiz Test Questions:

- The main “pacing” structure of the heart’s electrical activity is the:
  - AV node.
  - bundle of His.
  - Purkinje fibers.

- D. SA node.
- E. ventricular myocardium.

2. Atrioventricular node is located in the:

- A. aortic arch.
- B. atrial septum.
- C. ventricular myocardium.
- D. wall of the left atrium.
- E. wall of the right atrium.

3. The spread of the impulse through the ventricles (ventricular depolarization) is depicted on ECG as the:

- A. *P* wave.
- B. *PR* interval.
- C. *QRS* complex.
- D. *ST* segment.
- E. *QT* interval.

4. The impulses are transmitted through AV node at a rate of:

- A. 1-2 cm/s.
- B. 5-10 cm/s.
- C. 5-20 cm/s.
- D. 30-50 cm/s.
- E. 1 m/s.

5. Diaphragmatic or inferior myocardial infarction produces ECG changes in the leads:

- A. I, III, aVL, V<sub>5</sub>
- B. I, III, V<sub>3</sub>
- C. II, III, aVF
- D. III, aVF, V<sub>4</sub>
- E. III, V<sub>4</sub>, V<sub>6</sub>

NOTES

---

---

---

---

---

---

---

---

---

---

## Workbook 17

### Topic of practical class 17: “ECG signs of cardiac arrhythmias associated with altered automaticity and excitability”

**Summary of the topic.** The basic components that ensure the function of heart automaticity. ECG signs of altered automaticity: sinus tachycardia, sinus bradycardia, sinus arrhythmia, syndrome of sinus node weakness. The types of premature contractions (extrasystoles). ECG signs of sinus, atrial, atrioventricular (junctional or nodal), and ventricular premature contractions. Classification of ventricular extrasystoles. The types of allorhythmias.

#### Suggested Readings:

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.259-276.
2. Bates' guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagy, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.351-352, 400-401.
3. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 118, 136-139.

#### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. ECG signs of cardiac arrhythmias associated with altered automaticity and excitability. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Recording and analysis of ECG (official), 2017. Available at: [https://www.youtube.com/watch?v=1RUpDZliFC8&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=3](https://www.youtube.com/watch?v=1RUpDZliFC8&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=3)
3. Medistudents website. OSCE skills. Electrocardiography (ECG). Available at: <https://www.medistudents.com/electrocardiography-ecg>

### Variant 1

#### Write answers to the self-study questions:

1. Describe ECG signs of cardiac arrhythmias. Fill in the table:

|                   |  |
|-------------------|--|
| Sinus bradycardia |  |
| Sinus tachycardia |  |
| Sinus arrhythmia  |  |

2. Describe clinical findings in paroxysmal tachycardia.

3. What are ECG signs of junctional (nodal) extrasystoles? Fill in the table:

|                    |  |
|--------------------|--|
| <i>P</i> wave      |  |
| <i>PQ</i> interval |  |
| <i>QRS</i> complex |  |
| Compensatory pause |  |

4. What classification of extrasystoles do you know?

5. What are ECG signs of ventricular rhythm? Fill in the table:

|                    |  |
|--------------------|--|
| <i>P</i> wave      |  |
| <i>PQ</i> interval |  |
| <i>QRS</i> complex |  |
| Heart rate         |  |

### Quiz Test Questions:

1. The ECG sign of sinus tachycardia is:

- A. absence of *P* wave.
- B. heart rate more than 180 beats/min.
- C. heart rate more than 200 beats/min.
- D. increased *PQ* interval.
- E. short *TP* interval and *P* interpose on the *T*.

2. When each sinus beat is followed by extrasystole, this phenomenon is called:

- A. bigeminy.
- B. couplets.
- C. multifocal extrasystoles.
- D. quadrigeminy.
- E. trigeminy.

3. Activation of SA node is recorded on the normal ECG as:
- isoelectric line directly before *P* wave.
  - P* wave.
  - PQ* interval.
  - PQ* segment.
  - right-atrium part of *P* wave.
4. On the ECG supraventricular paroxysmal tachycardia is characterized by:
- heart rate less than 180 beats/min.
  - increased *PQ* interval ( $>0.2$  s).
  - irregular *RR* intervals, *P* waves absent.
  - negative *P* waves follow *QRS* complexes.
  - QRS* complexes distorted in shape, no *P* waves.
5. The ECG sign of premature atrial contraction is:
- absence of *P* wave.
  - disfigured *P* wave superimposes on the preceding *T*.
  - heart rate more than 60 beats/min.
  - increased *PQ* interval.
  - QRS* complex distorted in shape, no *P* wave.

### Variant 2

**Write answers to the self-study questions:**

1. Describe ECG signs of cardiac arrhythmias. Fill in the table:

|                                         |  |
|-----------------------------------------|--|
| Supraventricular paroxysmal tachycardia |  |
| Ventricular paroxysmal tachycardia      |  |

2. Which causes of sinus tachycardia and sinus bradycardia do you now? Fill in the table:

|                   |  |
|-------------------|--|
| Sinus tachycardia |  |
| Sinus bradycardia |  |

3. What are ECG signs of atrial extrasystoles? Fill in the table:

|                    |  |
|--------------------|--|
| <i>P</i> wave      |  |
| <i>PQ</i> interval |  |
| <i>QRS</i> complex |  |
| Compensatory pause |  |

4. Describe clinical findings in ventricular extrasystoles.

---



---



---



---



---

5. What are ECG signs of junctional (nodal) rhythm? Fill in the table:

|                    |  |
|--------------------|--|
| <i>P</i> wave      |  |
| <i>PQ</i> interval |  |
| <i>QRS</i> complex |  |
| Heart rate         |  |

### Quiz Test Questions:

- The ECG sign of sinus bradycardia is:
  - absence of *P* wave.
  - heart rate 40-50 beats/min.
  - heart rate more than 50 beats/min.
  - decreased *PQ* interval.
  - short *TP* interval and *P* interpose on the *T*.
- Extrasystoles, which originate from the different places of the heart and have different form, are known as:
  - allorhythmia.
  - couplets or triplets.
  - interpolated extrasystoles.
  - multifocal (polytopic) extrasystoles.
  - so-called *R* on *T* extrasystoles.
- Which dysrhythmia is a physiologic event during childhood?
  - Allorhythmia.
  - Multifocal premature contractions.
  - Paroxysmal tachycardia.
  - Sinus arrhythmia.
  - Sinus bradycardia.
- If the negative *P* waves follow the *QRS* complexes, the cardiac rhythm originates from:

5. On the ECG ventricular paroxysmal tachycardia is characterized by:
- A. heart rate less than 100 beats/min.
  - B. increased *PQ* interval ( $>0.2$  s).
  - C. irregular *RR* intervals, *P* waves absent.
  - D. negative *P* waves follow *QRS* complexes.
  - E. *QRS* complexes distorted in shape, no *P* waves.

## This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

## Workbook 18

### Topic of practical class 18: “ECG signs of conduction disorders and combined disorders of excitation and conduction”

**Summary of the topic.** The time of impulse passage in different parts of conductive system. ECG signs of sinoatrial and intraatrial block. Classification and ECG signs of atrioventricular block (AV block). Morgani-Addams-Stocks attack, the cause of its onset and clinical features. ECG diagnostics of the His bundle branches block, differences between left and right His bundle branch block. Acquaintance with evidences and rules of electroimpulse therapy.

Clinical and ECG diagnostics of atrial flutter and fibrillation. Clinical and ECG signs of paroxysmal ventricular tachycardia, ventricular flutter and fibrillation.

#### Suggested Readings:

1. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.277-288.
2. Bates' guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – P.351-352, 400-401.
3. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 136-139.

#### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. ECG signs of conduction disorders and combined disorders of excitation and conduction. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Recording and analysis of ECG (official), 2017.  
[https://www.youtube.com/watch?v=1RUpDZliFC8&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=3](https://www.youtube.com/watch?v=1RUpDZliFC8&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=3)
3. Medistudents website. OSCE skills. Electrocardiography (ECG). Available at: <https://www.medistudents.com/electrocardiography-ecg>

### Variant 1

#### Write answers to the self-study questions:

1. What are ECG findings in sinoatrial block?

---

---

---

---

---

---

2. Describe ECG signs of the second-degree AV block. Fill in the table:

|           |  |
|-----------|--|
| Mobitz I  |  |
| Mobitz II |  |

3. What are clinical and ECG signs of atrial fibrillation? Fill in the table:

|                      |  |
|----------------------|--|
| Arterial pulse       |  |
| <i>P</i> wave        |  |
| QRS complex          |  |
| <i>R-R</i> intervals |  |
| Heart rate           |  |

4. What is the Morgagni-Adams-Stokes syndrome?

---



---



---



---



---

5. Describe ECG signs of the left bundle branch block. Fill in the table:

|                             |  |
|-----------------------------|--|
| QRS duration                |  |
| QRS shape in $V_1$<br>$V_6$ |  |
| Axis of the heart           |  |

### Quiz Test Questions:

1. On the ECG atrial fibrillation is characterized by:

- A. heart rate less than 60 beats/min.
  - B. heart rate more than 180 beats/min.
  - C. increased *PQ* interval ( $>0.2$  s).
  - D. irregular *RR* intervals, *P* waves absent.
  - E. *QRS* complexes distorted in shape, no *P* waves.
2. Which dysrhythmia is a physiologic event during childhood?
- A. First-degree AV block.
  - B. Mobitz type II.
  - C. Multifocal premature contractions.
  - D. Sinus arrhythmia.
  - E. Sinus bradycardia.
3. A condition that is likely to present with dizziness and fainting is:
- A. atrial premature contraction.
  - B. complete AV block.
  - C. right bundle branch block.
  - D. sinus arrhythmia.
  - E. ventricular premature contraction.
4. The basic function of AV node is to:
- A. become a pacemaker in the case of sinus arrest.
  - B. delay the conduction of impulses.
  - C. ensure consecutive excitation of atria and ventricles.
  - D. filtrate passing impulses.
  - E. generate electrical impulses.
5. Fat deposits in the circulatory system of an elderly adult can lead to:
- A. diffuse conduction disturbances.
  - B. exaggerated contractility.
  - C. heart failure.
  - D. thinning of the ventricles.
  - E. ventricular fibrillation.

## Variant 2

### Write answers to the self-study questions:

1. What are ECG findings in intra-atrial block?

---



---



---



---



---



---

2. Describe ECG signs of the AV blocks. Fill in the table:

|                           |  |
|---------------------------|--|
| First-degree<br>AV block  |  |
| Second-degree<br>AV block |  |
| Third-degree<br>AV block  |  |

3. What are the main causes of atrial fibrillation?

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

4. Describe clinical and ECG signs of ventricular fibrillation. Fill in the table:

|                      |  |
|----------------------|--|
| Arterial pulse       |  |
| <i>P</i> wave        |  |
| QRS complex          |  |
| <i>R-R</i> intervals |  |
| Heart rate           |  |

5. Describe ECG signs of the right bundle branch block. Fill in the table:

|                             |  |
|-----------------------------|--|
| QRS duration                |  |
| QRS shape in $V_1$<br>$V_6$ |  |
| Axis of the heart           |  |

### Quiz Test Questions:

1. The ECG sign of first degree AV block is:
  - A. absence of *P* wave.
  - B. heart rate more than 50 beats/min.
  - C. increased *PQ* interval ( $>0.2$  s).
  - D. short *TP* interval and *P* interpose on the *T*.
  - E. sudden dropped *QRS*.
  
2. ECG changes commonly seen in the older adult include all of the following, except:
  - A. bundle branch block.
  - B. first-degree AV block.
  - C. left axis deviation.
  - D. left ventricular hypertrophy.
  - E. ventricular fibrillation.
  
3. An increase in heart rate during inspiration, with a decrease in this rate during expiration, is an expected finding in:
  - A. atrial flutter.
  - B. junctional rhythm.
  - C. Mobitz type I.
  - D. sinus arrhythmia.
  - E. ventricular fibrillation.
  
4. What arrhythmia may be accompanied by pulse deficit?
  - A. Atrial fibrillation.
  - B. Complete AV block.
  - C. First-degree AV block.
  - D. Paroxysmal arrhythmia.
  - E. Sinus arrhythmia.
  
5. The time interval between excitation (activation) of the right and left atria is:
  - A. 0.002-0.005 s.
  - B. 0.005-0.01 s.
  - C. 0.015-0.02 s.
  - D. 0.025-0.03 s.
  - E. 0.03-0.04 s.

### NOTES

---

---

---

---

---

---

---

## **Module 2 Symptoms and syndromes of internal diseases**

### **Workbook 19**

#### **Topic of practical class 19: “Mitral and aortic valve diseases: the chief symptoms and syndromes, clinical and instrumental methods of examination”**

**Summary of the topic.** Determination and widespread of valvular heart diseases, the frequency of heart valves disorders.

The main causes and mechanisms of mitral stenosis and mitral incompetence formation. Haemodynamic disorders in mitral valve diseases. The significance of Kitaev's reflex. The main complaints in patients with mitral stenosis and mitral incompetence. The peculiarities of data obtained by general inspection, inspection and palpation of the heart region, percussion in mitral valve diseases. Auscultative picture of mitral stenosis and mitral incompetence. ECG and phonocardiographic signs of mitral valve diseases. X-ray signs of the diseases. Mitral valve prolapse.

Etiological factors and mechanisms of aortic stenosis and aortic incompetence formation. Haemodynamic disorders in aortic valve diseases. The main complaints in patients with aortic stenosis and aortic incompetence. The peculiarities of data obtained by general inspection, inspection and palpation of the heart region, percussion in aortic valve diseases. Auscultative picture of aortic stenosis and aortic incompetence. ECG and phonocardiographic signs of aortic valve diseases. X-ray signs of the diseases.

#### **Suggested Readings:**

1. Propedeutics of internal medicine: textbook for English learning students of higher medical schools. Part 2. Syndromes and diseases / O.M. Kovalyova, S.O.Shapovalova, O.O. Nizhegorodtseva. - 4th ed. - Vinnytsia: Nova Knyha, 2019. – P.62-72.
2. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 128-139.

#### **Useful Links:**

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Mitral and aortic valve diseases: the chief symptoms and syndromes, clinical and instrumental methods of examination. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Examination of cardiovascular system (official), 2017.  
[https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=7](https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=7)
3. Medistudents website. OSCE skills. Cardiovascular (CVS) Examination. Available at: <https://www.medistudents.com/osce-skills/cardiovascular-examination>
4. Easy Auscultation website. Heart Sounds. Available at: <https://www.easyauscultation.com/heart-sounds>

### **Variant 1**

#### **Write answers to the self-study questions:**

1. What are the main causes of mitral and aortic valve diseases? Fill in the table:

| Valve disease        | Etiology |
|----------------------|----------|
| Mitral stenosis      |          |
| Mitral regurgitation |          |
| Aortic stenosis      |          |
| Aortic regurgitation |          |

2. What are clinical findings in mitral stenosis and aortic regurgitation? Fill in the table:

|                                                 | Mitral stenosis | Aortic regurgitation |
|-------------------------------------------------|-----------------|----------------------|
| Palpation<br>(apex beat, other pulsations)      |                 |                      |
| Percussion<br>(the borders of cardiac dullness) |                 |                      |

3. What are the specific changes of pulse and blood pressure in aortic valve diseases?  
Fill in the table:

|                | Aortic stenosis | Aortic regurgitation |
|----------------|-----------------|----------------------|
| Pulse          |                 |                      |
| Blood pressure |                 |                      |

4. What can be revealed by auscultation of the heart in mitral regurgitation and in aortic stenosis?  
Draw the phonocardiographic schemes, use ECG to specify heart sounds and relation of heart murmurs to systole or diastole. Indicate the area of auscultation.

|                      |  |
|----------------------|--|
| Mitral regurgitation |  |
|----------------------|--|

|                 |  |
|-----------------|--|
|                 |  |
| Aortic stenosis |  |

5. What results of ECG, X-ray and echocardiography can be used for diagnosis of mitral stenosis and aortic stenosis? Fill in the table:

|                  | Mitral stenosis | Aortic stenosis |
|------------------|-----------------|-----------------|
| ECG              |                 |                 |
| X-ray            |                 |                 |
| Echocardiography |                 |                 |

### Quiz Test Questions:

- Systolic murmur over the lower part of the sternum is increased by inspiration. You suspect:
  - aortic stenosis.
  - mitral regurgitation.
  - mitral stenosis.
  - pulmonary stenosis.
  - tricuspid regurgitation.
- Which of the following information belongs in the past medical history section related to heart and blood vessel assessment?
  - Adolescent inguinal hernia.
  - Childhood mumps.
  - Past incidence of bee stings.
  - Previous unexplained fever.
  - Allergies to foods.

3. A palpable rushing vibration over the apex of the heart at the 5th intercostal space is called a:
- heave.
  - lift.
  - thrill.
  - thrust.
  - rubbing.
4. A condition that is usually silent and painless until a stroke, dysrhythmia, or heart failure develops is:
- mitral insufficiency.
  - pericarditis.
  - angina.
  - cardiomyopathy.
  - cor pulmonale.
5. Diastolic murmur due to stenosed mitral orifice is heard:
- in the second interspace, to the left of the sternum.
  - greatest at the peak of inspiration.
  - in the second interspace, to the right of the sternum.
  - at the heart apex.
  - in the axillary area.

### Variant 2

#### Write answers to the self-study questions:

1. What are the common signs of mitral and aortic valve diseases? Fill in the table:

| Valve diseases | Chief complaints | General inspection |
|----------------|------------------|--------------------|
| Mitral         |                  |                    |
| Aortic         |                  |                    |

2. What are clinical findings in mitral regurgitation and aortic stenosis? Fill in the table:

|                                            | Mitral regurgitation | Aortic stenosis |
|--------------------------------------------|----------------------|-----------------|
| Palpation<br>(apex beat, other pulsations) |                      |                 |

|                                                    |  |  |
|----------------------------------------------------|--|--|
| Percussion<br>(the borders of<br>cardiac dullness) |  |  |
|----------------------------------------------------|--|--|

3. Describe the specific signs of valvular heart diseases:

1. *Pulsus differens* \_\_\_\_\_  
\_\_\_\_\_
2. Cats purr (thrill) \_\_\_\_\_  
\_\_\_\_\_
3. Quincke's sign \_\_\_\_\_  
\_\_\_\_\_
4. Musset's sign \_\_\_\_\_  
\_\_\_\_\_
5. Traube's doubled tone \_\_\_\_\_  
\_\_\_\_\_
6. Vinogradov-Duroziez doubled murmur \_\_\_\_\_  
\_\_\_\_\_

4. What can be revealed by auscultation of the heart in mitral stenosis and in aortic regurgitation? Draw the phonocardiographic schemes, use ECG to specify heart sounds and relation of heart murmurs to systole or diastole. Indicate the area of auscultation.

|                      |  |
|----------------------|--|
| Mitral stenosis      |  |
| Aortic regurgitation |  |

5. What results of ECG, X-ray and echocardiography can be used for diagnosis of mitral regurgitation and aortic regurgitation? Fill in the table:

|     |                      |                      |
|-----|----------------------|----------------------|
|     | Mitral regurgitation | Aortic regurgitation |
| ECG |                      |                      |

|                  |  |  |
|------------------|--|--|
|                  |  |  |
| X-ray            |  |  |
| Echocardiography |  |  |

### Quiz Test Questions:

- Diastolic murmur is heard in the third interspace, to the left of the sternum due to:
  - aortic regurgitation.
  - mitral regurgitation.
  - mitral stenosis.
  - pulmonary stenosis.
  - stenosed aortic orifice.
- A cardiac condition that may have an infectious or autoimmune etiology is:
  - infarction.
  - cor pulmonale.
  - hypertension.
  - myocarditis.
  - atrial septal defect.
- The level at which the jugular venous pulse is visible gives an indication of:
  - mitral valve incompetence.
  - aortic valve incompetence.
  - right atrial pressure.
  - left ventricular pressure.
  - volume depletion.
- A forceful and widely distributed apical impulse may be due to:
  - decreased cardiac output.
  - obesity.
  - hypertrophy of the left ventricle.
  - hyperventilation.
  - emphysema of the lungs.
- Mrs. K. is a 25-year-old office manager. She presents with fatigue, malaise, and a rash. On auscultation of her heart, you note systolic murmur at the apex. She reports a recent severe sore throat. You suspect:
  - aortic stenosis.
  - mitral regurgitation.

- ## NOTES

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

## Workbook 20

### Topic of practical class 20: “The chief symptoms and syndromes of essential and secondary arterial hypertension. Hypertensive crisis”

**Summary of the topic.** Definition of arterial hypertension by WHO/ISH (essential hypertension and secondary hypertension). The prominent risk factors for hypertension formation, and pathogenesis of the disease. Classification of arterial hypertension by arterial pressure level and target organs damage. The chief complaints, results of general inspection, inspection and palpation of the heart region, percussion, and auscultation in patients with arterial hypertension. ECG signs of myocardial changes due to hypertension. Secondary arterial hypertension. Complicated and uncomplicated hypertensive crisis.

#### Suggested Readings:

1. Propedeutics of internal medicine: textbook for English learning students of higher medical schools. Part 2. Syndromes and diseases / O.M. Kovalyova, S.O.Shapovalova, O.O. Nizhegorodtseva. - 4th ed. - Vinnytsia: Nova Knyha, 2019. – P.72-80.
2. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 120-123.
3. 2018 ESH/ESC Guidelines for the management of arterial hypertension // European Heart Journal. – 2018. – Vol.39 (33). – P.3021–3104.

#### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. The chief symptoms and syndromes of essential and secondary arterial hypertension. Hypertensive crisis. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. BP Measurement (official), 2017. [https://www.youtube.com/watch?v=dSxlqEGvzCA&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=1](https://www.youtube.com/watch?v=dSxlqEGvzCA&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=1)
3. OSCE-1. Bogomolets National Medical University. Examination of cardiovascular system (official), 2017. Available at: [https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=7](https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=7)
4. Blood Pressure Simulator. Easy Auscultation website. Available at: <https://www.easyauscultation.com/taking-blood-pressure>

### Variant 1

#### Write answers to the self-study questions:

1. What are definitions and classification of blood pressure levels? Fill in the table:

| Category | Systolic (mmHg) | Diastolic (mmHg) |
|----------|-----------------|------------------|
| Optimal  | < 120           | < 80             |
|          |                 |                  |
|          |                 |                  |

|  |  |  |
|--|--|--|
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

2. What are clinical findings in essential hypertension? Fill in the table:

|                               |  |
|-------------------------------|--|
| Complaints                    |  |
| General inspection            |  |
| Palpation of the heart region |  |
| Percussion of the heart       |  |
| Auscultation of the heart     |  |
| Pulse                         |  |
| Blood pressure                |  |

3. What is classification of hypertension by extent of target organ damage? Fill in the table:

| Stage of the AH | Target organ                                  | Signs of the affection |
|-----------------|-----------------------------------------------|------------------------|
| I               | No objective signs of the target organ damage |                        |
| II              | Heart                                         |                        |
|                 | Brain                                         |                        |
|                 | Retina                                        |                        |

|  |                     |  |
|--|---------------------|--|
|  | Kidney              |  |
|  | Peripheral arteries |  |

4. What endocrine causes of secondary hypertension do you know? Name at least 7 diseases.

---



---



---



---



---



---



---

5. What results of ECG, X-ray and echocardiography can be used for diagnosis of arterial hypertension? Fill in the table:

| Method                         | Signs of left ventricular hypertrophy | Other findings |
|--------------------------------|---------------------------------------|----------------|
| ECG                            |                                       |                |
| X-ray examination of the chest |                                       |                |
| Echocardiography               |                                       |                |

### Quiz Test Questions:

1. The upper level of the normal systolic arterial pressure is:

- A. 119 mmHg.
- B. 139 mmHg.
- C. 154 mmHg.
- D. 199 mmHg.
- E. 179 mmHg.

2. An example of hemodynamic arterial hypertension is one that is caused by:
  - A. aortic regurgitation.
  - B. glomerulonephritis.
  - C. mitral valve prolapse.
  - D. tachycardia.
  - E. ventricular septal defect.
  
3. To estimate the left border of the relative cardiac dullness by percussion, you should begin tapping at the:
  - A. anterior axillary line.
  - B. left sternal border.
  - C. midclavicular line.
  - D. midsternal line.
  - E. parasternal line.
  
4. The American Heart Association recommends recording which Korotkoff sounds?
  - A. Phases 1 and 4.
  - B. Phases 2 and 5.
  - C. Phases 1, 2, and 4.
  - D. Phases 1, 2, and 5.
  - E. Phases 1, 4, and 5.
  
5. Abdominal systolic bruit can be heard in the left upper quadrant due to:
  - A. aneurysm of the abdominal aorta.
  - B. perisplenitis.
  - C. radiation of the heart murmur.
  - D. renal artery stenosis.
  - E. stenosis of the abdominal aorta.

## Variant 2

### Write answers to the self-study questions:

1. What risk factors are used to evaluate the overall cardiovascular risk in patients with arterial hypertension? Name at least 7 factors.

---

---

---

---

---

---

---

2. What are clinical findings in Cushing's syndrome? Fill in the table:

|            |  |
|------------|--|
| Complaints |  |
|------------|--|

|                               |  |
|-------------------------------|--|
| General inspection            |  |
| Palpation of the heart region |  |
| Percussion of the heart       |  |
| Auscultation of the heart     |  |
| Pulse                         |  |
| Blood pressure                |  |

3. What is classification of hypertension by extent of target organ damage? Fill in the table:

| Stage of the AH | Target organ                                  | Signs of the affection |
|-----------------|-----------------------------------------------|------------------------|
| I               | No objective signs of the target organ damage |                        |
| III             | Heart                                         |                        |
|                 | Brain                                         |                        |
|                 | Retina                                        |                        |
|                 | Kidney                                        |                        |
|                 | Peripheral arteries                           |                        |

4. What non-endocrine causes of secondary hypertension do you know? Name at least 9 diseases.

---



---

---

---

---

---

---

---

5. What results of biochemical blood profile can be used for diagnosis of arterial hypertension? Fill in the table:

| Parameter              | Possible findings                | Normal values    |
|------------------------|----------------------------------|------------------|
| Fasting plasma glucose | >7.0 mmol/L in diabetes mellitus | 3.5 – 5.5 mmol/L |
| Total cholesterol      |                                  |                  |
| HDL-cholesterol        |                                  |                  |
| Fasting triglycerides  |                                  |                  |
| Uric acid              |                                  |                  |
| Creatinine             |                                  |                  |
| Potassium              |                                  |                  |
| Sodium                 |                                  |                  |
| Calcium                |                                  |                  |

### Quiz Test Questions:

- The upper level of the normal diastolic arterial pressure is:
  - 80 mmHg.
  - 84 mmHg.
  - 89 mmHg.
  - 94 mmHg.
  - 99 mmHg.
- What are signs of primary hyperaldosteronism (Conn's syndrome)?
  - Muscular weakness, polyuria, thirst.
  - Obesity, hirsutism, purple stria on the skin.
  - Sweating, tachycardia, pale skin.
  - Tremor, feeling of pressure in the neck.
  - Weight loss, sweating, atrial fibrillation.
- In young men, coarctation of the aorta should be suspected if you detect:
  - a delay between the radial and femoral pulses.
  - a simultaneous radial and femoral pulse.
  - an absent femoral pulse on the left.
  - an absent femoral pulse on the right.
  - bilateral absence of femoral pulses.
- If the apical impulse is more vigorous than expected, it is called a:

5. You are listening to a patient's heart in the aortic and pulmonic areas. You notice that S2 is heard better than S1 in both points, but over the aorta it is more intensive. You conclude:
- A. both sounds are normal.
  - B. S1 is diminished over the aorta.
  - C. S1 is diminished in both areas.
  - D. S2 is accented over the aorta.
  - E. S2 is diminished over the pulmonary trunk.

[illegible]

## Workbook 21

### Topic of practical class 21: “Ischemic heart disease: the chief symptoms and syndromes of angina pectoris and myocardial infarction”

**Summary of the topic.** Definition of “ischemic heart disease” (IHD). The main risk factors and pathogenesis of the disease. Modern classification of IHD. Definition and the chief clinical signs of angina pectoris. Functional classes of angina. Methods for objective evaluation of angina pectoris (ECG, 24-hours ambulatory ECG monitoring, stress testing, coronary angiography). Unstable angina, the concept of acute coronary syndrome (ACS). Definition and the main clinical symptoms of myocardial infarction. The data of objective examination in patients with myocardial infarction. The stages of myocardial infarction. ECG signs of transmural and subendocardial infarction, evolution of changes. Modern laboratory markers of myocardial infarction.

#### Suggested Readings:

1. Propedeutics of internal medicine: textbook for English learning students of higher medical schools. Part 2. Syndromes and diseases / O.M. Kovalyova, S.O.Shapovalova, O.O. Nizhegorodtseva. - 4th ed. - Vinnytsia: Nova Knyha, 2019. – P.80-94.
2. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.255-259.
3. Macleod’s Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 107-115.

#### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Ischemic heart disease: the chief symptoms and syndromes of angina pectoris and myocardial infarction. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Examination of cardiovascular system (official), 2017. Available at: [https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=7](https://www.youtube.com/watch?v=XzfgpYj06Cw&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=7)
3. OSCE-1. Bogomolets National Medical University. Recording and analysis of ECG (official), 2017. Available at: [https://www.youtube.com/watch?v=1RUpDZliFC8&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=3](https://www.youtube.com/watch?v=1RUpDZliFC8&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=3)
4. Geeky Medics. OSCE. Chest Pain History Taking. Available at: <https://geekymedics.com/chest-pain-history/>

## Variant 1

### Write answers to the self-study questions:

1. What are particularities of the chest pain in stable angina? Fill in the table:

| Pain feature | Characteristic |
|--------------|----------------|
| Location     |                |
| Irradiation  |                |

|                           |  |
|---------------------------|--|
| Character                 |  |
| Factors that provoke pain |  |
| Onset/Duration            |  |
| Factors that relieve pain |  |
| Associated symptoms       |  |
| Changes on the ECG        |  |

2. What is classification of ischemic heart disease? Fill in the table:

|    |                          |
|----|--------------------------|
| 1. |                          |
| 2. |                          |
| 3. |                          |
| 4. |                          |
| 5. |                          |
| 6. | Painless type of the IHD |

3. What are biochemical markers of the myocardial necrosis? Fill in the table:

| No | Marker                                   | Time for measuring |
|----|------------------------------------------|--------------------|
| 1. | Myoglobin                                |                    |
| 2. | Creatine kinase – MB                     |                    |
| 3. | Troponin I and T                         |                    |
| 4. | Aspartate transaminase (AST)             |                    |
| 5. | Lactate dehydrogenase LDH <sub>1-2</sub> |                    |

4. What are possible clinical findings in acute coronary syndrome? Fill in the table:

|                               |  |
|-------------------------------|--|
| Pulse                         |  |
| Blood pressure                |  |
| Palpation of the heart region |  |

|                           |  |
|---------------------------|--|
| Percussion of the heart   |  |
| Auscultation of the heart |  |
| Respiratory rate          |  |
| Auscultation of the lungs |  |

5. Specify ECG leads that can be used to define location of myocardial infarction:

| Location of MI  | ECG leads |
|-----------------|-----------|
| Anterior        |           |
| Anteroseptal    |           |
| Anterior apical |           |
| Lateral         |           |
| Diaphragmatic   |           |

### Quiz Test Questions:

- What location of the pain is typical for angina?
  - Left shoulder.
  - Neck.
  - Retrosternal.
  - To the left of the sternum.
  - To the right of the sternum.
- Which of the following is **not** a risk factor for ischemic heart disease?
  - Age > 55 years for men.
  - Cigarette smoking.
  - Diabetes mellitus.
  - HDL cholesterol > 1.5 mmol/L.
  - LDL cholesterol > 4.5 mmol/L.
- ECG changes commonly seen in the older adult include all of the following, except:
  - bundle branch block.
  - first-degree AV block.
  - left axis deviation.
  - left ventricular hypertrophy.
  - ventricular fibrillation.
- Systolic murmur due to atherosclerosis of aorta is heard:
  - in the second interspace, to the left of the sternum.
  - greatest at the peak of inspiration.

- C. in the second interspace, to the right of the sternum.
- D. at the heart apex.
- E. in the axillary area.

5. Diaphragmatic or inferior myocardial infarction produces ECG changes in the leads:

- A. I, III, aVL, V<sub>5</sub>
- B. I, III, V<sub>3</sub>
- C. II, III, aVF
- D. III, aVF, V<sub>4</sub>
- E. III, V<sub>4</sub>, V<sub>6</sub>

## Variant 2

**Write answers to the self-study questions:**

1. What are particularities of the chest pain in myocardial infarction? Fill in the table:

| Pain feature              | Characteristic |
|---------------------------|----------------|
| Location                  |                |
| Irradiation               |                |
| Character                 |                |
| Factors that provoke pain |                |
| Onset/Duration            |                |
| Factors that relieve pain |                |
| Associated symptoms       |                |
| Changes on the ECG        |                |

2. What is Canadian Cardiovascular Society classification of angina severity? Fill in the table:

| Class | Level of symptoms |
|-------|-------------------|
| I     |                   |
| II    |                   |
| III   |                   |
| IV    |                   |

3. Fill in the table of optimal values of lipids and lipoproteins in blood:

| No | Fasting lipid profile | Value, mmol/L |
|----|-----------------------|---------------|
| 1. | Total cholesterol     |               |
| 2. |                       |               |
| 3. |                       |               |
| 4. |                       |               |

4. List the complications of myocardial infarction:

1. Acute heart failure
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_

5. Specify ECG - changes in various areas of myocardial infarction:

| Zone                                              | Changes on the ECG |
|---------------------------------------------------|--------------------|
| Necrosis (infarction)                             |                    |
| Injury                                            |                    |
| Ischemia                                          |                    |
| Reciprocal effects on opposite side of infarction |                    |

### Quiz Test Questions:

1. Fat deposits in the circulatory system of an elderly adult can lead to:
  - A. diffuse conduction disturbances.
  - B. exaggerated contractility.
  - C. heart failure.
  - D. liver disorders.
  - E. thinning of the ventricles.
  
2. To confirm the diagnosis of myocardial infarction we should determine in blood:
  - A. alanine aminotransferase.
  - B. alkaline phosphatase.
  - C. bilirubin.
  - D. cholesterol.
  - E. creatine kinase.
  
3. Angina pectoris pain differs from chest discomfort caused by other conditions in that it is:

4. The auscultation of a three-component machinelike friction rub in a patient with acute chest pain should lead you to suspect:
- A. congestive heart failure.
  - B. pericarditis.
  - C. endocarditis.
  - D. cardiac tamponade.
  - E. myocardial infarction.
5. Anterior myocardial infarction produces ECG changes in the leads:
- A. I, II, aVF, V<sub>4</sub>
  - B. I, III, aVL, V<sub>5</sub>
  - C. I, aVR, V<sub>6</sub>
  - D. I, aVL, V<sub>3</sub>
  - E. III, aVF, V<sub>3</sub>

## This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

## Workbook 22

### Topic of practical class 22: “The main clinical signs of chronic bronchitis and asthma. Chronic obstructive pulmonary diseases”

**Summary of the topic.** Modern classification of chronic obstructive pulmonary diseases (COPD). Definition and main pathogenic factors for chronic bronchitis and bronchial asthma development. The chief complaints and objective examination data in patients with chronic bronchitis and bronchial asthma. Syndromes of bronchial obstruction, mucociliary incompetence and hyperinflation of the lungs. The basic methods of instrumental examination. Laboratory signs of bronchial asthma in blood and sputum analyses. Definition and main clinical signs of bronchiectatic disease.

#### Suggested Readings:

1. Propedeutics of internal medicine: textbook for English learning students of higher medical schools. Part 2. Syndromes and diseases / O.M. Kovalyova, S.O.Shapovalova, O.O. Nizhegorodtseva. - 4th ed. - Vinnytsia: Nova Knyha, 2019. – P.12-16, 27-39.
2. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.119-137.
3. Macleod’s Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 175-182.

#### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. The main clinical signs of chronic bronchitis and asthma. Chronic obstructive pulmonary diseases. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Respiratory system (official), 2017. Available at: <https://www.youtube.com/watch?v=eeK25NiKOKs&t=25s>
3. Medistudents website. OSCE skills. Respiratory Examination. Available at: <https://www.medistudents.com/osce-skills/respiratory-examination>
4. Easy Auscultation website. Lung Sounds. Available at: <https://www.easyauscultation.com/lung-sounds>

### Variant 1

#### Write answers to the self-study questions:

1. Define the term ‘chronic obstructive pulmonary diseases’ (COPD).

---

---

---

---

---

2. What are clinical findings in syndrome of hyperinflation of the lungs? Fill in the table:

| Examination technique | Specific signs |
|-----------------------|----------------|
|-----------------------|----------------|

|                           |  |
|---------------------------|--|
| Complaints                |  |
| General inspection        |  |
| Inspection of the chest   |  |
| Palpation of the chest    |  |
| Percussion of the lungs   |  |
| Auscultation of the lungs |  |

3. Describe symptoms and signs of asthma attack, fill in the table:

| Examination technique     | Specific signs |
|---------------------------|----------------|
| Complaints                |                |
| General inspection        |                |
| Inspection of the chest   |                |
| Palpation of the chest    |                |
| Percussion of the lungs   |                |
| Auscultation of the lungs |                |
| Pulse, blood pressure     |                |
| Auscultation of the heart |                |

4. What pulmonary function tests are used for diagnosis of asthma and COPD? What specific changes can be revealed?

---



---

---

---

---

---

---

---

---

---

5. What laboratory and instrumental studies are used for diagnostics of chronic bronchitis? Make a list, not less than 7 points:

| No | Method         | Possible findings                                                                                  |
|----|----------------|----------------------------------------------------------------------------------------------------|
| 1. | Blood analysis | Leukocytosis, neutrophilia, shift to the left, accelerated ESR, sometimes secondary erythrocytosis |
| 2. |                |                                                                                                    |
| 3. |                |                                                                                                    |
| 4. |                |                                                                                                    |
| 5. |                |                                                                                                    |
| 6. |                |                                                                                                    |
| 7. |                |                                                                                                    |

**Quiz Test Questions:**

1. The sputum contains a lot of eosinophils, Curschmann's spirals and Charcot-Leyden crystals. It indicates the presence of:

- A. asthma.
- B. carcinoma.
- C. dry pleurisy.
- D. pneumonia.
- E. viral infection.

2. The most typical finding(s) in chronic bronchitis is/are:

- A. crepitus indux.
- B. crepitus redux.
- C. dry and moist rales.
- D. pleural friction rub.
- E. tachypnea.

3. The characteristic barrel chest of the older adult is due to a combination of factors, including:
- A. decreased vital capacity.
  - B. increased muscular expansion of the chest wall.
  - C. increased vital capacity.
  - D. less fibrous alveoli.
  - E. skeletal changes of aging.
4. Breath sounds usually auscultated over most of the lung fields in patient with asthma are called:
- A. amphoric.
  - B. bronchial.
  - C. bronchovesicular.
  - D. tubular.
  - E. vesicular.
5. Lung emphysema is characterized by:
- A. dulled tympany heard on percussion.
  - B. dullness heard on percussion.
  - C. hyperresonance heard on percussion.
  - D. resonance heard on percussion.
  - E. tympany heard on percussion.

### Variant 2

#### Write answers to the self-study questions:

1. Define the term 'bronchiectasis', 'bronchiectatic disease'.

---



---



---



---



---

2. What are clinical findings in syndrome of bronchial obstruction? Fill in the table:

| Examination technique   | Specific signs |
|-------------------------|----------------|
| Complaints              |                |
| General inspection      |                |
| Inspection of the chest |                |
| Palpation of the chest  |                |

|                           |  |
|---------------------------|--|
| Percussion of the lungs   |  |
| Auscultation of the lungs |  |

3. Describe symptoms and signs of chronic bronchitis, fill in the table:

| Examination technique              | Specific signs |
|------------------------------------|----------------|
| Complaints                         |                |
| General inspection                 |                |
| Inspection of the chest            |                |
| Palpation of the chest             |                |
| Percussion of the lungs            |                |
| Auscultation of the lungs          |                |
| Pulse, blood pressure              |                |
| Palpation, percussion of the heart |                |
| Auscultation of the heart          |                |

4. What are specific sputum findings in asthma, bronchitis, and bronchiectasis?

---

---

---

---

---

---

---

---

5. What laboratory and instrumental studies are used for diagnostics of asthma? Make a list, not less than 7 points:

| No | Method         | Possible findings             |
|----|----------------|-------------------------------|
| 1. | Blood analysis | Eosinophilia, accelerated ESR |
| 2. |                |                               |
| 3. |                |                               |
| 4. |                |                               |
| 5. |                |                               |
| 6. |                |                               |
| 7. |                |                               |

### Quiz Test Questions:

1. The amount of air maximally expelled after the patient takes a maximal inspiration is the:

- A. tidal volume.
- B. expiratory reserve volume.
- C. total lung capacity.
- D. residual volume.
- E. vital capacity.

2. Which of the following is a risk factor for chronic bronchitis?

- A. Exposure to ultraviolet lights in the office setting.
- B. Hard exercise.
- C. Increased alcohol intake.
- D. Increased dietary salt intake.
- E. Smoking.

3. Spirography should be used to:

- A. characterize lung ventilation.
- B. confirm the presence of blood in pleural fluid.
- C. detect Curschmann spirals.
- D. distinguish between pneumonia and cancer.
- E. examine malignant tumor cells.

4. In barrel chest there is:

- A. a decrease in the anteroposterior diameter.
- B. an increase in the anteroposterior diameter.

- ## NOTES

[illegible]

## Workbook 23

**Topic of practical class 23: “Pneumonia: symptoms and syndromes; clinical, instrumental and laboratory methods of examination. Pneumosclerosis. Lung cancer. The chief symptoms and syndromes of dry pleurisy, pleurisy with effusion”**

**Summary of the topic.** Definition and modern classification of pneumonias (community-acquired, hospital-acquired (nosocomial), aspiration pneumonia, pneumonia in persons with compromised immune system). The main etiologic factors of pneumonia. Patient's complaints and peculiarities of objective examination data in lobar (pleuropneumonia) and focal (bronchopneumonia) pneumonia. Criteria of pneumonia severity. Instrumental methods for diagnosis of lung tissue consolidation. Laboratory signs of inflammatory syndrome in pneumonias. The main causes of pneumosclerosis. Objective and instrumental data in patients with pneumosclerosis. The main clinical forms of lung cancer: the peculiarities of clinical signs in central and peripheral tumor localization. Syndrome of lung tissue consolidation.

The causes of pleurae inflammation. The ways of intrapleural fluid formation and circulation in normal and pathologic conditions. The peculiarities of patient's complaints in dry pleurisy and pleurisy with effusion, the differences of data obtained by objective examination (palpation, percussion, auscultation) in different forms of pleurisies. Syndromes of fluid and air accumulation in pleural cavity. Possibilities of instrumental diagnostics. Pleural puncture (thoracentesis) and study of pleural fluid. The differences between exudates and transudates according to the results of objective and laboratory exam. The basic clinical features and stages of respiratory failure syndrome.

### Suggested Readings:

1. Propedeutics of internal medicine: textbook for English learning students of higher medical schools. Part 2. Syndromes and diseases / O.M. Kovalyova, S.O.Shapovalova, O.O. Nizhegorodtseva. - 4th ed. - Vinnytsia: Nova Knyha, 2019. – P. 8-12, 16-24, 39-46.
2. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.119-137.
3. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 170-182.

### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Pneumonia: symptoms and syndromes; clinical, instrumental and laboratory methods of examination. Pneumosclerosis. Lung cancer. The chief symptoms and syndromes of dry pleurisy, pleurisy with effusion. Available at: <https://likar.nmuofficial.com>
2. OSCE-1. Bogomolets National Medical University. Respiratory system (official), 2017. Available at: <https://www.youtube.com/watch?v=eeK25NiKOKs&t=25s>
3. Medistudents website. OSCE skills. Respiratory Examination. Available at: <https://www.medistudents.com/osce-skills/respiratory-examination>
4. Easy Auscultation website.Lung Sounds. Available at: <https://www.easyauscultation.com/lung-sounds>

## Variant 1

**Write answers to the self-study questions:**

1. What are clinical findings in syndrome of consolidation of lung tissue? Fill in the table:

| Examination technique     | Specific signs |
|---------------------------|----------------|
| Complaints                |                |
| General inspection        |                |
| Inspection of the chest   |                |
| Palpation of the chest    |                |
| Percussion of the lungs   |                |
| Auscultation of the lungs |                |

2. Describe symptoms and signs of focal pneumonia (bronchopneumonia), fill in the table:

| Examination technique     | Specific signs |
|---------------------------|----------------|
| Complaints                |                |
| General inspection        |                |
| Inspection of the chest   |                |
| Palpation of the chest    |                |
| Percussion of the lungs   |                |
| Auscultation of the lungs |                |

3. What laboratory and instrumental methods should be used for diagnostics of lung cancer? Make a list, not less than 7 points:

| No | Method         | Possible findings                                                  |
|----|----------------|--------------------------------------------------------------------|
| 1. | Blood analysis | Anemia, accelerated ESR, sometimes leukocytosis, shift to the left |

|    |  |  |
|----|--|--|
|    |  |  |
| 2. |  |  |
| 3. |  |  |
| 4. |  |  |
| 5. |  |  |
| 6. |  |  |
| 7. |  |  |

4. What are clinical findings in syndrome of fluid accumulation in the pleural cavity? Fill in the table:

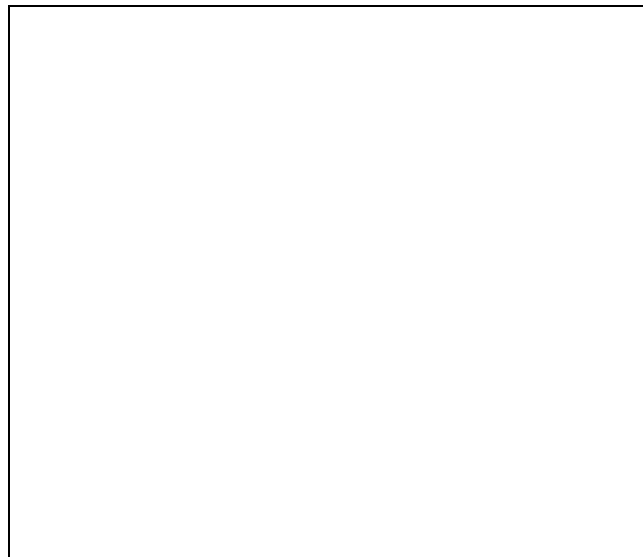
| Examination technique     | Specific signs |
|---------------------------|----------------|
| Complaints                |                |
| General inspection        |                |
| Inspection of the chest   |                |
| Palpation of the chest    |                |
| Percussion of the lungs   |                |
| Auscultation of the lungs |                |

5. Describe symptoms and signs of dry pleurisy, fill in the table:

| Examination technique | Specific signs |
|-----------------------|----------------|
| Complaints            |                |

|                           |  |
|---------------------------|--|
| General inspection        |  |
| Inspection of the chest   |  |
| Palpation of the chest    |  |
| Percussion of the lungs   |  |
| Auscultation of the lungs |  |

6. What are the Damoiseau curve, the Garland triangle and the Rauchfuss-Grocco triangle? Draw a layout of these areas. What physical signs can be revealed in the Rauchfuss-Grocco triangle?




---



---



---



---



---

7. How will you differentiate transudates and exudates? Define and characterize pleural fluid of transudates:

| Characteristics of transudates | Findings |
|--------------------------------|----------|
| Causes                         |          |
| Specific gravity               |          |

| Characteristics of transudates    | Findings            |
|-----------------------------------|---------------------|
| pH                                |                     |
| Total protein in pleural fluid    |                     |
| Pleural fluid/serum protein ratio |                     |
| Pleural fluid/serum LDH ratio     |                     |
| Glucose                           |                     |
| White blood cell count            | $< 1 \times 10^9/L$ |
| Cholesterol                       |                     |
| X-ray: upper border of the fluid  |                     |

### Quiz Test Questions:

- The percussion sound over the Garland triangle is:
  - absolutely dull.
  - dull with a tympanic tone.
  - hyperresonant (bandbox).
  - resonant.
  - tympanic with a metallic tone.
- The most typical finding(s) in initial stage of lobar pneumonia is/are:
  - crepitus indur.
  - crepitus redux.
  - dry and moist rales.
  - pleural friction rub.
  - tachypnea.
- The percussion sound over an empty large long standing cavern is:
  - absolutely dull.
  - dull with a tympanic tone.
  - hyperresonant (bandbox).
  - resonant.
  - tympanic with a metallic tone.
- Characteristics of lobar consolidation of pulmonary tissue are:
  - amphoric breathing, medium bubbling rales.
  - diminished to absent breath sounds.
  - pathological bronchial breathing, egophony.
  - vesicular breathing, dry sibilant rales (wheezes).
  - vesicular breathing, pleural friction rub.
- Characteristics of pneumothorax are:
  - amphoric breathing, intensified bronchophony.
  - bronchovesicular breathing, tachypnea.
  - respiratory lag, intensified tactile fremitus.
  - tachypnea, edema.
  - tympany heard with percussion, dyspnea.

## Variant 2

### Write answers to the self-study questions:

1. What are clinical findings in syndrome of cavity in the lung? Fill in the table:

| Examination technique     | Specific signs |
|---------------------------|----------------|
| Complaints                |                |
| General inspection        |                |
| Inspection of the chest   |                |
| Palpation of the chest    |                |
| Percussion of the lungs   |                |
| Auscultation of the lungs |                |

2. Describe symptoms and signs in different stages of lobar pneumonia, fill in the table:

| Examination technique     | Specific signs |                       |                |
|---------------------------|----------------|-----------------------|----------------|
|                           | Initial stage  | Height of the disease | Recovery stage |
| Complaints                |                |                       |                |
| General inspection        |                |                       |                |
| Inspection of the chest   |                |                       |                |
| Palpation of the chest    |                |                       |                |
| Percussion of the lungs   |                |                       |                |
| Auscultation of the lungs |                |                       |                |

3. What laboratory and instrumental studies are used for diagnostics of pneumonia? Make a list, not less than 7 points:

| No | Method         | Possible findings                                              |
|----|----------------|----------------------------------------------------------------|
| 1. | Blood analysis | Leukocytosis, neutrophilia, shift to the left, accelerated ESR |
| 2. |                |                                                                |
| 3. |                |                                                                |
| 4. |                |                                                                |
| 5. |                |                                                                |
| 6. |                |                                                                |
| 7. |                |                                                                |

4. What are clinical findings in syndrome of air accumulation in the pleural cavity? Fill in the table:

| Examination technique     | Specific signs |
|---------------------------|----------------|
| Complaints                |                |
| General inspection        |                |
| Inspection of the chest   |                |
| Palpation of the chest    |                |
| Percussion of the lungs   |                |
| Auscultation of the lungs |                |

5. Describe symptoms and signs of pleurisy with effusion, fill in the table:

| Examination technique     | Specific signs |
|---------------------------|----------------|
| Complaints                |                |
| General inspection        |                |
| Inspection of the chest   |                |
| Palpation of the chest    |                |
| Percussion of the lungs   |                |
| Auscultation of the lungs |                |

6. What are the Damoiseau curve, the Garland triangle and the Rauchfuss-Grocco triangle? Draw a layout of these areas. What physical signs can be revealed in the Garland triangle?




---



---



---



---



---

7. How will you differentiate transudates and exudates? Define and characterize pleural fluid of exudates:

| Characteristics of exudates              | Findings                |
|------------------------------------------|-------------------------|
| Causes                                   |                         |
| Specific gravity                         |                         |
| pH                                       |                         |
| Total protein in pleural fluid           |                         |
| Pleural fluid/serum protein ratio        |                         |
| Pleural fluid/serum LDH ratio            |                         |
| Glucose                                  |                         |
| White blood cell count with differential |                         |
| Cholesterol                              | < 45 mg/dL (1.2 mmol/L) |
| X-ray: upper border of the fluid         |                         |

### Quiz Test Questions:

- Yellow, green, or rust-colored sputum usually indicates the presence of:
  - bacterial infection.
  - carcinoma.
  - infarction.
  - pleurisy.
  - viral infection.
- Characteristics of focal consolidation of pulmonary tissue are:
  - amphoric breathing, intensified bronchophony.
  - bronchovesicular breathing, tachypnea.
  - diminished to absent breath sounds.
  - tachypnea, edema.
  - tympany heard with percussion, dyspnea.
- The dull sound over a part of the lung may be determined in:
  - bronchial asthma.
  - cavern.
  - lung cancer.
  - lung emphysema.
  - pneumothorax.
- The most typical finding(s) in dry pleurisy is/are:
  - crepitus indux.
  - crepitus redux.
  - dry and moist rales.
  - pleural friction rub.
  - tachypnea.
- To distinguish between a respiratory friction rub and a cardiac friction rub, ask the patient to:
  - hold his or her breath.
  - identify the location of his or her pain.
  - lay down on his left side.

D. lean forward.

E. say “ninety-nine” while you palpate the anterior chest.

## NOTES

This image shows a single page from a notebook or ledger. The page is oriented vertically and contains approximately 28 evenly spaced horizontal black lines. These lines are designed for writing and extend across most of the width of the page. There are no vertical margin lines, headers, footers, or other markings present on the document. The background is plain white.

## Workbook 24

**Topic of practical class 24: “Clinical, instrumental and laboratory examination of the patients with chronic gastritis, peptic ulcer disease, and intestine pathology. The chief symptoms and syndromes”**

**Summary of the topic.** Definition and modern classification of gastritis and peptic ulcer disease. The main etiologic factors. The widespread of *Helicobacter pylori*, conditions for stomach and duodenal mucus damage. The chief complaints in patients with gastritis and peptic ulcer disease. The peculiarities of the pain depending on the process localization and function of acid production. The clinical features of dyspepsia syndrome in patients with gastritis and peptic ulcer disease. Instrumental and laboratory diagnostic possibilities. The main complications of peptic ulcer disease. Syndrome of gastrointestinal bleeding. The chief symptoms and syndromes in patients with enteritis and colitis: syndrome of intestinal dyspepsia, syndrome of malabsorption and maldigestion, irritable bowel syndrome.

### Suggested Readings:

1. Propedeutics of internal medicine: textbook for English learning students of higher medical schools. Part 2. Syndromes and diseases / O.M. Kovalyova, S.O.Shapovalova, O.O. Nizhegorodtseva. - 4th ed. - Vinnytsia: Nova Knyha, 2019. – P. 111-115, 119-125, 129-132.
2. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.347-364.
3. Macleod’s Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 190-192, 209-212.

### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. Clinical, instrumental and laboratory examination of the patients with chronic gastritis, peptic ulcer disease, and intestine pathology. Available at: <https://likar.nmuofficial.com>
2. OSCE-1.Bogomolets National Medical University. Examination of gastrointestinal system (official), 2017. Available at: [https://www.youtube.com/watch?v=K0RN4NM6IbY&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=8](https://www.youtube.com/watch?v=K0RN4NM6IbY&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=8)
3. Medistudents website. OSCE skills. Abdominal (GI) Examination. Available at: <https://www.medistudents.com/osce-skills/abdominal-examination>

## Variant 1

**Write answers to the self-study questions:**

1. What complaints are specific for gastric disorders with increased acid secretion? Name at least 7 symptoms.

---

---

---

---

---

2. What are the main complications of peptic ulcer disease?

1. Gastrointestinal bleeding
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

3. What are clinical manifestations of ulcer perforation? Fill in the table:

| Examination technique                                        | Specific signs |
|--------------------------------------------------------------|----------------|
| Complaints                                                   |                |
| General inspection                                           |                |
| Inspection,<br>auscultation,<br>percussion of the<br>abdomen |                |
| Palpation of the abdomen                                     |                |

4. What laboratory tests are used for diagnosis of malabsorption syndrome? What specific changes can be revealed by stool examination?

---

---

---

---

---

5. What laboratory and instrumental studies are used for diagnostics of chronic gastritis? Make a list, not less than 9 points:

| No | Method         | Possible findings |
|----|----------------|-------------------|
| 1. | Blood analysis | Normal or anemia. |
| 2. |                |                   |
| 3. |                |                   |
| 4. |                |                   |
| 5. |                |                   |
| 6. |                |                   |
| 7. |                |                   |
| 8. |                |                   |
| 9. |                |                   |

### Quiz Test Questions:

1. Fibrogastroscopy should be used to:

- A. characterize gastric secretion.
- B. characterize liver function.
- C. differentiate cirrhosis from hepatitis.
- D. examine gastric mucosa.
- E. examine mucosa of the rectum.

2. What is/are the sign(s) of gastric hemorrhage?

- A. Green-colored feces, diarrhea.
- B. Hematemesis and tarry feces.
- C. Intermittent abdominal pain.
- D. Severe constipation.
- E. Steatorrhea and creatorrhea.

3. Which common gastrointestinal disorder has been associated with infection with an organism called *Helicobacter pylori*?

- A. Cholecystitis.
- B. Crohn disease.
- C. Duodenal ulcer.
- D. Esophagitis.

E. Ulcerative colitis.

4. A patient with malignant tumor of stomach was examined. What specific changes in a gastric juice analysis could be found?

- A. Altered leukocytes and erythrocytes.
- B. Increased free hydrochloric acid.
- C. Large amount of lactic acid.
- D. Muscles fibers, cellulose.
- E. Squamous epithelium.

5. \_\_\_\_\_ is a term for a condition in which the acidified liquid content of the stomach backs up into the esophagus.

- A. Acid regurgitation.
- B. Duodenogastric reflux disease.
- C. Gastroesophageal reflux disease.
- D. Hyperacidic esophagitis.
- E. Peptic ulcer disease.

### Variant 2

#### Write answers to the self-study questions:

1. What complaints are specific for gastric disorders with decreased acid secretion? Name at least 7 symptoms.

---

---

---

---

---

2. What are clinical findings in syndrome of upper gastrointestinal bleeding? Fill in the table:

| Examination technique                | Specific signs |
|--------------------------------------|----------------|
| Complaints                           |                |
| General inspection                   |                |
| Objective examination of the abdomen |                |

| Examination technique | Specific signs |
|-----------------------|----------------|
| Pulse, blood pressure |                |

3. Describe symptoms and signs of duodenal ulcer, fill in the table:

| Examination technique                               | Specific signs |
|-----------------------------------------------------|----------------|
| Complaints                                          |                |
| General inspection                                  |                |
| Inspection, auscultation, percussion of the abdomen |                |
| Palpation of the abdomen                            |                |

4. What specific changes can be revealed by stool examination in patients with exocrine pancreatic insufficiency, intestinal dyspepsia?

---



---



---



---



---

5. What laboratory and instrumental studies are used for diagnostics of peptic ulcer disease? Make a list, not less than 9 points:

| No | Method         | Possible findings                                       |
|----|----------------|---------------------------------------------------------|
| 1. | Blood analysis | Normal or possible iron deficiency anemia, leukocytosis |

| No | Method | Possible findings |
|----|--------|-------------------|
| 2. |        |                   |
| 3. |        |                   |
| 4. |        |                   |
| 5. |        |                   |
| 6. |        |                   |
| 7. |        |                   |
| 8. |        |                   |
| 9. |        |                   |

### Quiz Test Questions:

1. Black-colored feces usually indicate the presence of:

- A. bacterial infection
- B. drinking cacao
- C. drinking coffee
- D. gastric hemorrhage
- E. hemorrhage from the rectum

2. Mr. N. has a several-week history of severe intermittent abdominal burning sensations. His pain occurs 1.5 hours after meals, may be nocturnal. Mr. N.'s history is most consistent with which condition?

- A. Acute appendicitis.
- B. Chronic gastritis.
- C. Duodenal ulcer.
- D. Pancreatitis.
- E. Systemic infection.

3. Which finding is most characteristic of acute inflammation of the peritoneum?

- A. Blumberg sign
- B. Courvoisier-Terrier sign
- C. Kehr sign
- D. Mendel sign
- E. Murphy sign



## Workbook 25

**Topic of practical class 25: “The chief symptoms and syndromes of biliary diseases: chronic cholecystitis, cholangitis, and cholelithiasis. The main clinical and laboratory signs of chronic hepatitis and liver cirrhosis”**

**Summary of the topic.** Definition and modern classification of chronic cholecystitis, cholangitis. The notion about bile tract dyskinesia and its types. The chief complaints and objective data in patients with chronic cholecystitis and cholangitis. Instrumental methods of examination of biliary system pathology. Laboratory diagnostics and study of duodenal contents. Cholelithiasis: the chief complaints and objective data. The peculiarities of pain syndrome. The main clinical features of jaundice and cholestatic syndromes, their laboratory signs.

Definition and modern classification of chronic hepatitis and liver cirrhosis. Etiology of these diseases. Pathogenesis of viral hepatitis. Chief complaints of the patients, peculiarities of general inspection and objective examination. Morphological and biochemical signs of liver damage. The notion about index of histological activity and Child-Pugh criteria. The syndromes of portal hypertension, hepatic failure and hepatolienal syndrome. The main complications of liver cirrhosis.

### Suggested Readings:

1. Propedeutics of internal medicine: textbook for English learning students of higher medical schools. Part 2. Syndromes and diseases / O.M. Kovalyova, S.O.Shapovalova, O.O. Nizhegorodtseva. - 4th ed. - Vinnytsia: Nova Knyha, 2019. – P. 101-111, 115-119, 125-129, 132-139.
2. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.347-351, 364-367.
3. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 195-204.

### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. The chief symptoms and syndromes of biliary diseases: chronic cholecystitis, cholangitis, and cholelithiasis. The main clinical and laboratory signs of chronic hepatitis and liver cirrhosis. Available at: <https://likar.nmuofficial.com>
2. OSCE-1.Bogomolets National Medical University. Examination of gastrointestinal system (official), 2017. Available at: [https://www.youtube.com/watch?v=K0RN4NM6IbY&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=8](https://www.youtube.com/watch?v=K0RN4NM6IbY&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=8)
3. Medistudents website. OSCE skills. Abdominal (GI) Examination. Available at: <https://www.medistudents.com/osce-skills/abdominal-examination>

## Variant 1

**Write answers to the self-study questions:**

1. What are clinical findings in syndrome of parenchymatous jaundice? Fill in the table:

| Jaundice | Specific signs |
|----------|----------------|
| Etiology |                |

|                           |  |
|---------------------------|--|
| Color of the skin         |  |
| Pruritus                  |  |
| Hepatomegaly              |  |
| Gallbladder               |  |
| Splenomegaly              |  |
| Biochemical blood profile |  |
| Urinalysis                |  |
| Stool examination         |  |

2. Describe symptoms and signs of cholelithiasis, fill in the table:

| Examination technique                | Specific signs |
|--------------------------------------|----------------|
| Complaints                           |                |
| General inspection                   |                |
| Objective examination of the abdomen |                |

3. What laboratory tests and indices are used to characterize liver function? What specific changes can be revealed?

---

---

---

---

---

---

---

---

4. How will you differentiate hepatitis and cirrhosis? What is portal hypertension?

---

---

---

---

---

---

---

5. What laboratory and instrumental studies are used for diagnostics of cholecystitis? Make a list, not less than 7 points:

| No | Method         | Possible findings                                              |
|----|----------------|----------------------------------------------------------------|
| 1. | Blood analysis | Leukocytosis, neutrophilia, shift to the left, accelerated ESR |
| 2. |                |                                                                |
| 3. |                |                                                                |
| 4. |                |                                                                |
| 5. |                |                                                                |
| 6. |                |                                                                |
| 7. |                |                                                                |

**Quiz Test Questions:**

1. Patients presenting with ascites, cutaneous spider veins, and enlarged spleen exhibit signs of:

- A. hepatic insufficiency.
- B. malabsorption syndrome.
- C. pancreatitis.
- D. syndrome of the “acute abdomen”.
- E. syndrome of portal hypertension.

2. Very light tan or gray stool may indicate:

- A. upper GI bleeding.
- B. obstructive jaundice.
- C. lower GI bleeding.
- D. polyposis.
- E. ulcerative colitis.

3. Kehr sign is described as:

- A. abrupt cessation of respiration with palpation of the gallbladder.
- B. pain when gallbladder point is palpated.

- C. pain with heel jar.
- D. pain with percussion on the right costal arch.
- E. rebound tenderness.

4. The distance between the upper and lower borders of liver dullness in the right parasternal line is normally:

- A. 6-8 cm.
- B. 7-9 cm.
- C. 8-10 cm.
- D. 9-11 cm.
- E. 10-12 cm.

5. What is the “minor” sign of liver cirrhosis?

- A. Cachexia.
- B. Firm, moderately enlarged liver.
- C. Hematemesis and tarry feces.
- D. Jaundice.
- E. Spider angiomas.

### Variant 2

**Write answers to the self-study questions:**

1. What are clinical findings in syndrome of obstructive (mechanical) jaundice? Fill in the table:

| Jaundice                  | Specific signs |
|---------------------------|----------------|
| Etiology                  |                |
| Color of the skin         |                |
| Pruritus                  |                |
| Hepatomegaly              |                |
| Gallbladder               |                |
| Splenomegaly              |                |
| Biochemical blood profile |                |
| Urinalysis                |                |
| Stool examination         |                |

2. Describe symptoms and signs of chronic hepatitis, fill in the table:

| Examination technique | Specific signs |
|-----------------------|----------------|
| Complaints            |                |

|                                      |  |
|--------------------------------------|--|
| General inspection                   |  |
| Objective examination of the abdomen |  |

3. What are the main complications of liver cirrhosis?

1. Hepatic encephalopathy
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

4. What is diagnostic value of the study of duodenal contents, portions A, B and C?

---



---



---



---



---



---

5. What laboratory and instrumental studies are used for diagnostics of hepatitis and liver cirrhosis?  
Make a list, not less than 7 points:

| No | Method         | Possible findings                                   |
|----|----------------|-----------------------------------------------------|
| 1. | Blood analysis | Leukopenia, thrombocytopenia, anemia, increased ESR |
| 2. |                |                                                     |
| 3. |                |                                                     |
| 4. |                |                                                     |

|    |  |  |
|----|--|--|
| 5. |  |  |
| 6. |  |  |
| 7. |  |  |

### Quiz Test Questions:

- Which gastrointestinal disease has been associated with virus infection?
  - Chronic cholecystitis.
  - Chronic gastritis.
  - Duodenal ulcer.
  - Hepatitis.
  - Pancreatitis.
- When auscultating the abdomen, what finding would indicate collateral circulation between the portal and systemic venous systems?
  - Arterial bruit.
  - Borborygmi.
  - Gastric rumbling.
  - Renal hyperresonance.
  - Venous hum.
- Patients presenting with ascites, jaundice, and cutaneous spider veins exhibit signs of:
  - cholecystitis.
  - cirrhosis.
  - Crohn disease.
  - inflammatory bowel disease.
  - pancreatitis.
- Ortner sign is described as:
  - abrupt cessation of respiration with palpation of the gallbladder.
  - pain when gallbladder point is palpated.
  - pain with heel jar.
  - pain with percussion on the right costal arch.
  - rebound tenderness.
- Which of the following is more commonly palpable in a healthy patient?
  - Gallbladder.
  - Left kidney.
  - Liver.
  - Right kidney.
  - Spleen.

NOTES

---

## Workbook 26

### **Topic of practical class 26: “The chief signs and syndromes in nephrology: acute and chronic glomerulonephritis and pyelonephritis. Chronic kidney disease”**

**Summary of the topic.** Definition and modern classification of glomerulonephritis and pyelonephritis. Etiology and pathogenesis of these diseases. Chief complaints of the patients, peculiarities of general inspection and objective examination. Edema and arterial hypertension syndromes in renal diseases. Instrumental diagnostic methods. Laboratory examination: urinalysis, urine analysis by Nechiporenko, Amburge, Addis-Kackovsky, Zimnitsky. Acute nephritic and nephrotic syndromes. Biochemical blood analysis in renal pathology. Renal failure and renal colic syndromes. Definition and classification of chronic kidney disease.

#### **Suggested Readings:**

1. Propedeutics of internal medicine: textbook for English learning students of higher medical schools. Part 2. Syndromes and diseases / O.M. Kovalyova, S.O.Shapovalova, O.O. Nizhegorodtseva. - 4th ed. - Vinnytsia: Nova Knyha, 2019. – P. 140-162.
2. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.371-406.
3. Macleod’s Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 220-234.

#### **Useful Links:**

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. The chief signs and syndromes in nephrology: acute and chronic glomerulonephritis and pyelonephritis. Chronic kidney disease. Available at: <https://likar.nmuofficial.com>
2. OSCE-1.Bogomolets National Medical University. Examination of gastrointestinal system (official), 2017. Available at: [https://www.youtube.com/watch?v=K0RN4NM6IbY&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=8](https://www.youtube.com/watch?v=K0RN4NM6IbY&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=8)
3. Medistudents website. OSCE skills. Urinalysis (UA). Available at: <https://www.medistudents.com/osce-skills/urinalysis>
4. Medistudents website. OSCE skills. 24 Hour Urine Collection. Available at: <https://www.medistudents.com/osce-skills/24-hour-urine-collection>

### **Variant 1**

#### **Write answers to the self-study questions:**

1. What are the main syndromes in nephrology?

1. Nephrotic
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

2. What are clinical findings in acute glomerulonephritis? Fill in the table:

| Examination technique | Specific signs |
|-----------------------|----------------|
| Complaints            |                |
| Objective examination |                |
| Changes in urinalysis |                |

3. Describe the main syndromes or clinical signs of organ damage in chronic renal failure, fill in the table:

| System/organ     | Signs of affection                                                                                         |
|------------------|------------------------------------------------------------------------------------------------------------|
| Cardiovascular   | Uremic cardiomyopathy, pericarditis, arterial hypertension, arrhythmias and acute left ventricular failure |
| Gastrointestinal |                                                                                                            |
| Nervous          |                                                                                                            |
| Lungs            |                                                                                                            |

4. What instrumental methods are used for diagnosis of renal failure? What specific changes can be revealed?

---



---



---



---



---



---



---

5. What laboratory and instrumental studies are used for diagnostics of pyelonephritis? Make a list, not less than 9 points:

| No | Method         | Possible findings                                              |
|----|----------------|----------------------------------------------------------------|
| 1. | Blood analysis | Leukocytosis, neutrophilia, shift to the left, accelerated ESR |
| 2. |                |                                                                |
| 3. |                |                                                                |
| 4. |                |                                                                |
| 5. |                |                                                                |
| 6. |                |                                                                |
| 7. |                |                                                                |
| 8. |                |                                                                |
| 9. |                |                                                                |

### Quiz Test Questions:

1. Edema of nephrotic syndrome have such peculiarity:

- A. usually appear on legs after exercise.
- B. mostly locate in back-sacrum area.
- C. appear on the face after sleep.
- D. skin over edema with a blue tint.
- E. skin over edema is cold.

2. Zimnitsky's test helps to determine:

- A. aminoaciduria.
- B. erythrocyturia.
- C. lipiduria.
- D. nocturia.
- E. proteinuria.

3. Nechiporenko's test helps to define:

- A. hypersthenuria.
- B. hyposthenuria.

- C. ketonuria.
- D. leucocyturia.
- E. proteinuria.

4. Casts help to determine the affection of:

- A. renal arteries.
- B. tubuli renalis.
- C. kidney pelvis.
- D. kidney calyces.
- E. urethra, ureter.

5. Investigation of 24-hour urine amount is necessary for evaluation of:

- A. hyaline casts.
- B. tubular cell casts.
- C. granular casts.
- D. macrohematuria.
- E. massive proteinuria.

## Variant 2

**Write answers to the self-study questions:**

1. List the main signs of nephrotic syndrome:

1. Proteinuria  $>3.0$  g/24 h
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

2. What are clinical findings in acute pyelonephritis? Fill in the table:

| Examination technique | Specific signs |
|-----------------------|----------------|
| Complaints            |                |
| Objective examination |                |
| Changes in urinalysis |                |

3. Describe the main syndromes or clinical signs of organ damage in chronic renal failure, fill in the table:

| System/organ               | Signs of affection                                                                                         |
|----------------------------|------------------------------------------------------------------------------------------------------------|
| Cardiovascular             | Uremic cardiomyopathy, pericarditis, arterial hypertension, arrhythmias and acute left ventricular failure |
| Endocrine, musculoskeletal |                                                                                                            |
| Blood                      |                                                                                                            |
| Skin                       |                                                                                                            |

4. What laboratory tests are used for diagnosis of renal failure? What specific changes can be revealed in blood and urine?

---



---



---



---



---



---



---

5. What laboratory and instrumental studies are used for diagnostics of glomerulonephritis? Make a list, not less than 9 points:

| No | Method         | Possible findings                      |
|----|----------------|----------------------------------------|
| 1. | Blood analysis | Anemia, leukocytosis and increased ESR |
| 2. |                |                                        |
| 3. |                |                                        |
| 4. |                |                                        |

|    |  |  |
|----|--|--|
| 5. |  |  |
| 6. |  |  |
| 7. |  |  |
| 8. |  |  |
| 9. |  |  |

### Quiz Test Questions:

- Breath odors may clue the examiner to certain underlying metabolic conditions. The odor of ammonia on the breath may signify:
  - uremia.
  - tuberculosis.
  - hepatic dysfunction.
  - diabetic ketoacidosis.
  - gastric cancer.
- A patient with chronic renal failure exhibits azotemia, hypo- and isosthenuria. What is the main factor in the pathogenesis of these symptoms in the patient?
  - Decrease in glomerular filtration rate in each nephron.
  - Disturbance of the permeability of the glomerular membrane.
  - Increase in glomerular filtration rate.
  - Reduction of existing nephrons mass.
  - Reduction of tubular secretion.
- Nechiporenko's test helps to define:
  - bacteriuria
  - erythrocyturia.
  - glucosuria.
  - isosthenuria.
  - polyuria.
- Zimnitsky's test helps to determine:
  - casts.
  - erythrocyturia.
  - hypossthenuria.
  - leucocyturia.
  - proteinuria.
- Normal 24-hour urine volume is:
  - 400 ml.
  - 1300 ml.
  - 2100 ml.

D. 2500 ml.

E. 2800 ml.

## NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

## Workbook 27

### Topic of practical class 27: “The chief symptoms and syndromes of anemia. Blood analysis”

**Summary of the topic.** Definition and modern classification of anemia. The main laboratory criteria. The pathogenesis of iron deficit. The main clinical features of sideropenia and general hypoxia due to the iron deficiency anemia. Laboratory signs of the iron deficiency anemia. Etiology and pathogenesis of B<sub>12</sub>-folate deficiency anemia. The features of anemic syndrome, syndromes of digestive organs damage, phunicular myelosis and peripheral blood disorders in B<sub>12</sub>-folate deficiency anemia. The prominent laboratory signs of B<sub>12</sub>-folate deficiency anemia. Inherent and acquired hemolytic anemia: features of anemic and jaundice syndromes, splenomegaly and internal organ's haemosiderosis. The basic laboratory criteria for hemolytic anemia and peculiarities of bilirubin metabolism. Blood tests and their interpretation.

#### Suggested Readings:

1. Propedeutics of internal medicine: textbook for English learning students of higher medical schools. Part 2. Syndromes and diseases / O.M. Kovalyova, S.O.Shapovalova, O.O. Nizhegorodtseva. - 4th ed. - Vinnytsia: Nova Knyha, 2019. – P. 163-202.
2. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – P.407-417.
3. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – P. 48, 54-55, 102.

#### Useful Links:

1. Bogomolets National Medical University. Platform for distance learning LIKAR\_NMU. Course “Propaedeutics of internal medicine PIM № 2”. The chief symptoms and syndromes of anemia. Blood analysis. Available at: <https://likar.nmuofficial.com>
2. OSCE-1.Bogomolets National Medical University. Examination of gastrointestinal system (official), 2017. Available at: [https://www.youtube.com/watch?v=K0RN4NM6IbY&list=PLDlhn5aYOA9RHcRbBrpFmg\\_Ut\\_RgUI0tW&index=8](https://www.youtube.com/watch?v=K0RN4NM6IbY&list=PLDlhn5aYOA9RHcRbBrpFmg_Ut_RgUI0tW&index=8)
3. Medistudents website. OSCE skills. Abdominal (GI) Examination. Available at: <https://www.medistudents.com/osce-skills/abdominal-examination>

### Variant 1

#### Write answers to the self-study questions:

1. What are definition and classification of anemia? Fill in the table:

| Cause          | Anemia                         |
|----------------|--------------------------------|
| I. Blood loss: | - acute post hemorrhagic;<br>- |
| II.            | -<br>-<br>-                    |

|      |   |
|------|---|
| III. | - |
|      | - |

2. What are clinical findings in syndrome of hemolytic jaundice? Fill in the table:

| Jaundice                  | Specific signs |
|---------------------------|----------------|
| Etiology                  |                |
| Color of the skin         |                |
| Pruritus                  |                |
| Hepatomegaly              |                |
| Gallbladder               |                |
| Splenomegaly              |                |
| Biochemical blood profile |                |
| Urinalysis                |                |
| Stool examination         |                |

3. What are normal values for blood analysis? Fill in the table:

| Parameter                                                                                                                          | Normal values                 |                               |
|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|
|                                                                                                                                    | males                         | females                       |
| Erythrocytes (RBC)                                                                                                                 | $(4.0-5.1) \times 10^{12} /L$ | $(3.7-4.7) \times 10^{12} /L$ |
| Hemoglobin (Hb)                                                                                                                    |                               |                               |
| Color index                                                                                                                        |                               |                               |
| Reticulocytes                                                                                                                      |                               |                               |
| Platelets                                                                                                                          |                               |                               |
| Leucocytes (WBC)                                                                                                                   |                               |                               |
| Differential count:<br>Basophils<br>Eosinophils<br>Neutrophils:<br>bands<br>polymorphonuclear (mature)<br>Lymphocytes<br>Monocytes |                               |                               |
| Erythrocyte sedimentation rate (ESR)                                                                                               |                               |                               |

4. Describe clinical features of iron deficiency anemia, fill in the table:

| Examination technique                          | Specific signs |
|------------------------------------------------|----------------|
| Complaints                                     |                |
| General inspection                             |                |
| Objective examination of tongue and abdomen    |                |
| Pulse, blood pressure                          |                |
| Objective examination of the heart and vessels |                |

5. What are specific findings in blood analysis of patients with vitamin B<sub>12</sub>-deficiency anemia? Fill in the table:

| Parameter          | Possible findings |
|--------------------|-------------------|
| Erythrocytes (RBC) |                   |
| Hemoglobin (Hb)    |                   |
| Color index        |                   |
| Reticulocytes      |                   |
| Platelets          |                   |
| Leucocytes (WBC)   |                   |
| ESR                |                   |
| Other              |                   |

**Quiz Test Questions:**

1. A smooth, red tongue with a slick appearance may indicate:
  - A. eating disorders.
  - B. fungal infection.
  - C. oral cancer.
  - D. recent use of antibiotics.
  - E. vitamin B<sub>12</sub> deficiency.
  
2. To palpate inguinal nodes, you should have the patient:
  - A. bend over a table and cough.
  - B. lie supine, knees slightly flexed.
  - C. lie supine, legs extended.
  - D. stand and bend backward.
  - E. stand and cough vigorously.
  
3. A 40-year-old man has jaundice and microcytic anemia. What can be the cause of such disorders?
  - A. Lack of iron.
  - B. Intensive destruction of erythrocytes.
  - C. Decline of synthesis of erythrocytes.
  - D. Lack of vitamin B<sub>12</sub>.
  - E. Lack of folic acid.
  
4. A 25-year-old woman complains of weakness, poor appetite, and desire to eat chalk, permanent pain in epigastria. The skin and mucosa are pallid. Blood analysis shows: erythrocytes  $3.4 \times 10^{12}/L$ , hemoglobin 70 g/L, color index 0.62, reticulocytes 2%, leucocytes  $4.7 \times 10^9/L$ , ESR 27 mm/hour. Clinical and laboratory data confirm the presence of:
  - A. acute posthemorrhagic anemia.
  - B. B<sub>12</sub> (folic) deficiency anemia.
  - C. chronic posthemorrhagic anemia.
  - D. hemolytic anemia.
  - E. iron deficiency anemia.
  
5. Which of the following symptoms suggests bleeding as a cause of acute anemia?
  - A. Chest pain.
  - B. Glossitis.
  - C. Heart murmur.
  - D. Jaundice.
  - E. Melena.

### Variant 2

#### Write answers to the self-study questions:

1. What is etiology of iron deficiency anemia? Name the four main groups of causes and give as many examples as possible for each group.

---

---

---

---

---

2. What are clinical findings in syndrome of parenchymatous jaundice? Fill in the table:

| Jaundice                  | Specific signs |
|---------------------------|----------------|
| Etiology                  |                |
| Color of the skin         |                |
| Pruritus                  |                |
| Hepatomegaly              |                |
| Gallbladder               |                |
| Splenomegaly              |                |
| Biochemical blood profile |                |
| Urinalysis                |                |
| Stool examination         |                |

3. What are normal values for blood analysis? Fill in the table:

| Parameter                                                                                                                          | Normal values                 |                               |
|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|
|                                                                                                                                    | males                         | females                       |
| Erythrocytes (RBC)                                                                                                                 | $(4.0-5.1) \times 10^{12} /L$ | $(3.7-4.7) \times 10^{12} /L$ |
| Hemoglobin (Hb)                                                                                                                    |                               |                               |
| Color index                                                                                                                        |                               |                               |
| Reticulocytes                                                                                                                      |                               |                               |
| Platelets                                                                                                                          |                               |                               |
| Leucocytes (WBC)                                                                                                                   |                               |                               |
| Differential count:<br>Basophils<br>Eosinophils<br>Neutrophils:<br>bands<br>polymorphonuclear (mature)<br>Lymphocytes<br>Monocytes |                               |                               |
| Erythrocyte sedimentation rate (ESR)                                                                                               |                               |                               |

4. Describe clinical features of vitamin B<sub>12</sub> -deficiency anemia, fill in the table:

| Examination technique                          | Specific signs |
|------------------------------------------------|----------------|
| Complaints                                     |                |
| General inspection                             |                |
| Objective examination of tongue and abdomen    |                |
| Pulse, blood pressure                          |                |
| Objective examination of the heart and vessels |                |

5. What are specific findings in blood analysis of patients with hemolytic anemia? Fill in the table:

| Parameter          | Possible findings |
|--------------------|-------------------|
| Erythrocytes (RBC) |                   |
| Hemoglobin (Hb)    |                   |
| Color index        |                   |
| Reticulocytes      |                   |
| Platelets          |                   |
| Leucocytes (WBC)   |                   |
| ESR                |                   |
| Other              |                   |

**Quiz Test Questions:**

1. The examination of the upper left quadrant of the abdominal cavity is essential to the evaluation of the immune system because of the location of which of the following organs?
  - A. Kidney.
  - B. Liver.
  - C. Pancreas.
  - D. Spleen.
  - E. Stomach.
  
2. The more tender a lymph node, the more likely a/an:
  - A. infection.
  - B. innocent cause.
  - C. leukemia.
  - D. malignancy.
  - E. metabolic disease.
  
3. A man suffering from a kidneys disease has anemia. The most probable reason for anemia can be a disorder in the secretion of certain matter. What matter is it?
  - A. Antidiuretic hormone.
  - B. Renin.
  - C. Aldosterone.
  - D. Atrial natriuretic factor.
  - E. Erythropoietin.
  
4. A 65-year-old man has the number of erythrocytes in blood  $2.9 \times 10^{12}/L$ , Hb – 68 g/L, color index – 0.71. These changes can be specific for:
  - A. hyperchromic anemia.
  - B. hypochromic anemia.
  - C. macrocytic anemia.
  - D. microcytic anemia.
  - E. normochromic anemia.
  
5. A patient has developed megaloblastic anemia on a background of alcoholic cirrhosis. The main cause of anemia in this patient is the following vitamin deficiency:
  - A. biotin.
  - B. bolic acid.
  - C. lipoic acid.
  - D. pantothenic acid.
  - E. thiamin.

#### NOTES

---

---

---

---

---

---

## ALGORITHMS FOR OBJECTIVE STRUCTURED CLINICAL EXAM (OSCE)

### Top 10 tips for clinical examinations\*

Every medical school teaches clinical skills in a slightly different manner. The following list will provide a basis from which to form your own techniques around.

#### **Tip 1**

Wash your hands at the beginning and the end of every examination. There are usually two marks available for doing this which can make a big difference if your procedure has not gone well.

#### **Tip 2**

Introduce yourself to the patient and clarify their identity.

#### **Tip 3**

Be polite to your patient and always thank them for their time. These people are often real patients providing their own free time for your education. Also remember to thank your examiner.

#### **Tip 4**

Be gentle during an examination. Note that the patient may have been examined 10 or 20 times prior to you. It will not look good for your examiner if the patient appears in pain.

#### **Tip 5**

Look smart. Although there are no points for this, it does give the examiner a sense that you are taking the exam seriously.

#### **Tip 6**

Tie up any long hair.

#### **Tip 7**

Wear nothing below the elbow, including watches. Note that if an examination requires a timer, one will be provided.

#### **Tip 8**

If you are unsure of what is being asked of you then ask your examiner for clarification. You will not lose marks for this, but you will do if you go on to perform the incorrect technique.

#### **Tip 9**

If you remember something that you should have performed earlier then do go back and do this. You will not lose many marks for performing the order incorrectly, but you will lose more marks if you do not perform the procedure at all.

#### **Tip 10**

If the examiner has left out equipment for you then use, then be sure to use them, for example gloves and an apron. These are not laid out to trick you.

\*Source: Medistudents website. Top 10 tips for clinical examinations. Last updated October 3, 2017. Available at <https://www.medistudents.com/osce-skills/top-10-tips-for-clinical-examinations>

### ***OSCE station. Measurement of blood pressure***

1. Wash your hands and introduce yourself to the patient. Confirm his/her name and date of birth. Explain the procedure and obtain his/her consent.
2. Measurement of blood pressure (BP) should be conducted in a peaceful environment after 5-minute rest.
3. During the 30 minutes before measuring blood pressure patient should not smoke or drink coffee.
4. Ensure that you have the following necessary equipment:
  - a sphygmomanometer
  - a stethoscope
  - hand cleansing gel
5. Ensure that you have selected the correct cuff size for your patient. A different cuff size may be required for obese patients or children.
6. Position the sphygmomanometer so that it is roughly at the level of the patient's heart.
7. Position the patient's right arm so that it is horizontal at heart level and free from obstructive clothing.
8. Wrap the cuff around the patient's upper arm ensuring the arrow is in line with the brachial artery. This should be determined by feeling the brachial pulse.
9. Determine a rough value for the systolic blood pressure. This can be done by palpating the radial pulse and inflating the cuff until the pulse can no longer be felt. The reading at this point should be noted and the cuff deflated.
10. Now that you have a rough value, the true value can be measured. Place the diaphragm of your stethoscope over the brachial artery and reinflate the cuff to 20-30 mmHg higher than the estimated value taken before.
11. Then deflate the cuff at 2 mmHg per second until you hear the first Korotkoff sound – this is the systolic blood pressure.
12. Continue to deflate the cuff until the sounds disappear, the 5th Korotkoff sound – this is the diastolic blood pressure.
13. Measurement should be done at least twice at intervals of 2-3 minutes. When divergence of the results is greater than 5 mm Hg it is necessary to make repeated measurements in a few minutes.
14. The first measurement of blood pressure should be done in both arms, as well as sitting, standing and lying down. Higher values are taken into account; that correspond more accurately to intra-arterial blood pressure.

Furthermore, you should explain to your examiner that you would want to check the blood pressure standing to check for a significant drop ( $>20$  mmHg after 2 minutes). This would suggest a postural hypotension.

Measurement of blood pressure at the first and fifth minutes after transition to orthostasis must be necessarily conducted in elderly patients, patients with diabetes and in all cases when orthostatic hypotension is present or suspected.

15. Finally, you should inform the patient of his/her blood pressure, and thank him/her.
16. Wash your hands. Make a conclusion about the level of blood pressure in accordance with current guidelines.

### **Classification of office blood pressure and definitions of hypertension grade\***

According to 2018 ESH/ESC Guidelines for the management of arterial hypertension

| <b>Category</b>                | <b>Systolic (mmHg)</b> | <b>Dyastolic (mmHg)</b> |
|--------------------------------|------------------------|-------------------------|
| Optimal                        | $<120$                 | $<80$                   |
| Normal                         | 100 – 130              | 60 – 85                 |
| High normal                    | 130 – 139              | 85 – 89                 |
| Grade 1 hypertension           | 140 – 159              | 90 – 99                 |
| Grade 2 hypertension           | 160 – 179              | 100 – 109               |
| Grade 3 hypertension           | $\geq 180$             | $\geq 110$              |
| Isolated systolic hypertension | $\geq 140$             | $<90$                   |

\*Source: 2018 ESH/ESC Guidelines for the management of arterial hypertension // European Heart Journal. – 2018. – Vol.39 (33). – P.3021–3104.

Additional illustrations and useful tips for blood pressure measurement are available at Medistudents website: <https://www.medistudents.com/en/learning/osce-skills/cardiovascular/blood-pressure-measurement/>

## **OSCE station. Physical examination**

### **Comparative percussion of the lungs**

1. Wash your hands and introduce yourself to the patient. Confirm his/her name and date of birth. Explain the procedure and obtain his/her consent.
2. Ask the patient to remove clothing from the chest.
3. The patient should be in a comfortable posture and relaxed. The best position is standing or sitting. The student should be in a comfortable position as well.
4. The comparative percussion is carried out on symmetrical sites in the following sequence: supraclavicular regions, the area of the collarbones (clavicles), subclavian regions, axillary regions, suprascapular regions, interscapular regions, and subscapular regions. Loud percussion is used.
5. Stand up or sit down in front of the patient. Place the finger-plessimeter in the supraclavicular region in parallel to the collarbone so that the joint between the distal and middle phalanges (the point of tapping) coincide with the middle of the collarbone. Make 2 strikes and repeat this procedure in the symmetrical region on the opposite side. Compare the obtained sounds.
6. Provide percussion of the collarbone using direct percussion.
7. In the subclavian areas, the finger-plessimeter is located in the intercostal spaces, so that the joint between the distal and middle phalanges (the point of tapping) passes along the midclavicular line.
8. Comparative percussion on the left is carried out only to the 2nd intercostal space because the dullness of the heart may be located below.
9. To the right, below the 2nd intercostal space, comparative percussion is performed along the parasternal and anterior axillary lines.
10. Before carrying out comparative percussion in axillary areas, ask the patient to raise his/her hands and put them behind his head.
11. In the axillary regions, the finger-plessimeter is kept in the intercostal spaces, so that the joint between the distal and middle phalanges (the point of tapping) is along midaxillary line.
12. Ask the patient to turn his/her back to you.
13. The finger-plessimeter is placed in the suprascapular region horizontally, parallel to the spine of the shoulder blade, so that the base of the hand faces the shoulder joint, and the border between the distal and middle phalanges (the point of tapping) passes along the scapular line. The same percussion should be made on a symmetrical section on the other side.
14. Before providing comparative percussion in the interscapular area, ask the patient to cross the arms in front of him/her and decline his/her head slightly forward.
15. Percussion is carried out parallel to the spine in the upper, middle and lower part of interscapular areas or by the "fir tree" method (at the angle to the spine in each intercostal space).
16. In the subscapular region, the finger-plessimeter is located in the intercostal spaces, so that the joint between the distal and middle phalanges (the point of tapping) passes along scapular line. Compare percussion sounds on both sides down to the 9th intercostal space.
17. Make a general conclusion about the results of comparative percussion of the lungs, indicating the nature of the percussion sound and its symmetry over the lungs.
18. Thank the patient and wash hands.

## **OSCE station. Physical examination**

### **Auscultation of the lungs**

1. Wash your hands and introduce yourself to the patient. Confirm his/her name and date of birth. Explain the procedure and obtain his/her consent.
2. Ask the patient to undress to the waist and sit on a chair.
3. Auscultation can be performed in sitting or standing position, it depends on general condition of the patient. With deep breathing, the patient may experience dizziness.
4. Press the diaphragm of a stethoscope against the patient's body tightly, but not hard.
5. Ask the patient to breathe normally with a half-open mouth (this is important, as patients often have difficulty breathing through the nose and auscultation may be accompanied by additional noise). Listen to at least one full breath cycle in each location.
6. Auscultation is carried out on symmetrical areas in the following sequence: supraclavicular, subclavian, axillary, suprascapular, interscapular and subscapular regions.
7. Auscultation in the subclavian region on the left is carried out only up to the 2nd intercostal space, since the heart is located below.
8. On the right side below the 2nd intercostal space, auscultation of the lungs is performed along the parasternal and anterior axillary lines.
9. Before auscultation in axillary regions, ask the patient to raise his/her hands and put them behind his head.
10. In the axillary regions, auscultate the upper, middle and lower parts with the stethoscope located along midaxillary lines.
11. Ask the patient to turn his/her back to you.
12. Place the stethoscope in the suprascapular region above the spine of the scapula and then compare with the symmetrical region on the other side.
13. Before auscultation in the interscapular area, ask the patient to cross the arms in front of him/her and decline his/her head slightly forward.
14. Auscultate in the upper, middle and lower part of interscapular areas.
15. In the subscapular regions, place the stethoscope along the scapular lines. Compare auscultative picture on both sides down to the 9th intercostal space.
16. During auscultation in each area, it is necessary to listen to the breath sounds with calm breathing, then ask the patient to breathe more deeply and listen once more, then ask the patient to cough and listen again at the same point. These techniques are used for differential diagnosis of adventitious breath sounds.
17. Make a general conclusion about the results of auscultation of the lungs, indicating the nature of the main and adventitious (if any) breath sounds and their symmetry over the lungs.
18. Thank the patient and wash hands.

## **OSCE station. Physical examination**

### **Examination of radial pulse**

1. Wash your hands and introduce yourself to the patient. Confirm his/her name and date of birth. Explain the procedure and obtain his/her consent.
2. Ask the patient to release the lower third of the forearm, remove the watch and lay on the couch or sit on a chair. Ensure that he/she is comfortable.
3. Sit on the right side of the patient's bed, face to the patient.
4. To palpate the pulse on the radial artery, the student's hand covers the patient's forearm so that the thumb is located on the elbow side of the forearm and the rest of the fingers in the sulcus radialis. The back surface of the patient's forearm and hand is on the palm of the student.
5. First, assess pulse symmetry by taking it on both hands. Compare pulse filling on the right and left radial arteries.
6. With the same filling of the pulse on both hands, continue further examination on any hand. If there is a difference in pulse filling, determine other properties on the radial artery where pulse filling is greater.
7. Examine pulse rhythm or regularity.
8. Determine pulse rate. If the pulse is regular, count for at least 30 seconds and multiply by 2 the obtained number. If the pulse is irregular, count for a full minute and note the number of irregular beats per minute. Normal adult pulse is 60 to 90 beats/minute; regular in rhythm.
9. Determine pulse force or tension. It is characterized by the force that is applied when pressing the artery wall to stop its pulsation. Pulse can be tense or hard, moderately tense and soft.
10. Examine pulse filling. It is determined by the sensation of an increase in the volume (diameter) of the artery as the pulse wave passes. First, with a proximally located finger compress the radial artery for a few seconds, and then lift this finger and with distally located fingers feel the fullness of the first pulse wave that appears after the artery is released. Pulse can be of moderate filling, full and empty.
11. Determine pulse uniformity. Assess whether the amplitude of the separate pulse waves is the same. Normally, pulse waves have a constant equal amplitude, and such a pulse is called uniform.
12. Determine pulse deficit – the difference between heart rate and pulse rate. It is assessed by simultaneous auscultation of the heart and palpation of the radial pulse. Place the stethoscope at the heart apex, and at the same time palpate the radial pulse with your other hand. Compare heart beats and pulse waves within a minute. Calculate only heart contractions, which are not accompanied by the appearance of a pulse wave on the radial artery - this will be pulse deficit.
13. Finally, you should summarise your findings, and thank the patient.
14. Wash your hands.

## **OSCE station. Physical examination**

### **Palpation of the apical impulse of the heart**

1. Wash your hands and introduce yourself to the patient. Confirm his/her name and date of birth. Explain the procedure and obtain his/her consent.
2. Ask the patient to remove clothing from the chest and lay on the couch. Ensure that he/she is comfortable.
3. Take a classic position at the patient's bedside: sit on the right side of the patient at the level of his pelvis, face to patient.
4. Place the right hand on the left half of the chest as follows: the base of the hand is turned to the sternum, the thumb along the sternum, and other fingers placed in 3-5 intercostal spaces. The fingertips reach the anterior axillary line (1st position of the hand).
5. Gradually pull the fingers along the intercostal spaces (without detaching from the chest) in the direction of the sternum to find by palpation the lowest and leftmost pulsation point (2nd position of the hand).
6. Without removing your fingers from the chest, turn the base of the hand counterclockwise by 90 degrees so that fingers are placed along the intercostal space in which the pulsation was found. Leave only middle finger in the epicenter of the pulsation, placing it vertically, perpendicular to the chest (3rd position of the hand).
7. Determine the location of the apical impulse (intercostal space and position relative to the left midclavicular line).
8. Determine the area of the apical impulse: leave the middle finger over the epicenter of the pulsation and determine whether the area of the finger coincides with the area of the pulsation. Normally, the area of the apical impulse is near 2 cm<sup>2</sup>. This corresponds to the area of one finger. If the area of the pulsation is larger than one finger, then put another finger next to it (index finger).
9. Determine the height of the apical impulse. Visually examine fluctuations of the chest wall and of the palpating finger at the epicenter of the pulsation. In this case, the finger should not press hard and resist the apical impulse. The amplitude of fluctuation is not measured in millimeters, although it is known that it is normally near 2-3 mm. Apical impulse is estimated as high, moderately high and low. In case of high apical impulse, the chest and palpating finger noticeably and significantly (more than 3 mm) elevate. A moderately high apical impulse gives a slightly visible pulsation (about 3 mm). Low apical impulse is felt only by palpation without visible fluctuations of the palpating finger.
10. Determine the resistance of the apical impulse. This is a tactile sensation of the condition of the heart muscle at the time of contact with the finger, which can be compared with palpation m. biceps. Normally, the apical impulse is moderately resistant. It can be highly resistant and less resistant.
11. Make a conclusion about the properties of the apical impulse in following order: localization, area, height, resistance.
12. Thank the patient and wash hands.

## **OSCE station. Physical examination**

### **Determination by percussion of the relative cardiac dullness**

1. Wash your hands and introduce yourself to the patient. Confirm his/her name and date of birth. Explain the procedure and obtain his/her consent.
2. Ask the patient to remove clothing from the chest and lay on the couch. Ensure that he/she is comfortable.
3. Take a classic position at the patient's bedside: sit on the right side of the patient at the level of his pelvis, face to patient.
4. Determine the borders of the heart in the following sequence: right, upper, and then left.

#### ***Determination of the right border of the relative cardiac dullness.***

5. Determine the position of the diaphragm along the right midclavicular line. Place a finger-plethysmometer in the 3rd intercostal space at the right midclavicular line and percuss downward to dullness. In a healthy adult with a normosthenic chest, the position of the diaphragm is normally at the level of the 6th rib or 5th intercostal space.
6. Then you should go up for one rib and one intercostal space (or one intercostal space) from the determined border.
7. Place the finger-plethysmometer in the 4th intercostal space along right midclavicular line parallel to the sternum (vertically). Percuss with medium force and move towards the heart, gradually shifting the finger by 0.5-1 cm until dullness appears. The border is marked along the edge of the finger facing the resonant sound.

#### ***Determination of the upper border of the relative cardiac dullness.***

8. Place the finger-plethysmometer in the 1st intercostal space parallel to the ribs so that the joint between the distal and middle phalanges of the finger-plethysmometer (the point of tapping) is located on the left parasternal line (or 1 cm outward from the left edge of the sternum).
9. Move the finger-plethysmometer down the ribs and intercostal spaces, percussing with the middle force until the dull sound appears. The border is marked along the upper edge of the finger facing the resonant sound.

#### ***Determination of the left border of the relative cardiac dullness.***

10. Determine the position of the apical impulse by palpation. Percussion for the left border of the heart is carried out along the same intercostal space in which the apical impulse is localized. If the apical impulse is not palpable, then percussion is carried out in the 5th intercostal space.
11. Place the finger-plethysmometer parallel to the left border (vertically) in the intercostal space, in which the apical impulse was detected by palpation, along the anterior axillary line. If the apical impulse is found to the left of the anterior axillary line, then start percussion from the midaxillary line. Percuss with medium force and move towards the heart, gradually shifting the finger by 0.5-1 cm until dullness appears. The border is marked along the edge of the finger facing the resonant sound.
12. Finally, you should summarise your findings, and thank the patient.
13. Wash your hands.

## **OSCE station. Physical examination**

### **Auscultation of the heart**

1. Wash your hands and introduce yourself to the patient. Confirm his/her name and date of birth. Explain the procedure and obtain his/her consent.
2. Ask the patient to remove clothing from the chest and lay on the couch. Ensure that he/she is comfortable.
3. Take a classic position at the patient's bedside: sit on the right side of the patient at the level of his pelvis, face to patient.
4. Determine the position of the apical impulse by palpation. Place the stethoscope at the 1st auscultation point at the heart apex and listen with normal breathing. Normally, the point for auscultation of the mitral valve is located in the fifth intercostal space 1-1.5 cm medially from the left midclavicular line.
5. Ask the patient to breath in, breath out and then hold his/her breath for about 10 seconds. Listen to the heart sounds.
6. Ask the patient to breath in and then hold his/her breath for about 10 seconds. Listen to the heart sounds.
7. Ask the patient to turn to the left side, auscultate the 1st point in this position, and then ask to return to the previous position – lying on his/her back.
8. Place the stethoscope at the 2nd auscultation point to the right of the base of xiphoid process (the point for auscultation of the tricuspid valve) and listen with normal breathing. Then perform auscultation when the patient holds his/her breath on inhaling and on exhaling.
9. Place the stethoscope at the 3rd auscultation point in the second intercostal space to the right of the sternum (the point for auscultation of the aortic valve) and listen with normal breathing.
10. Place the stethoscope at the 4th auscultation point in the second intercostal space to the left of the sternum (the point for auscultation of the pulmonary valve) and listen with normal breathing. Compare the loudness of the 2nd sound over the aorta and pulmonary artery.
11. Return to the 2nd right intercostal space and auscultate when the patient holds his/her breath on inhaling and on exhaling.
12. Return to the 2nd left intercostal space and auscultate when the patient holds his/her breath on inhaling and on exhaling.
13. Place the stethoscope at the 5th auscultation point in the third intercostal space to the left of the sternum and listen with normal breathing.
14. Ask the patient to sit on the couch. Auscultate the heart in upright position.
15. Make a conclusion about heart sounds and murmurs.
16. Thank the patient and wash hands.

## **OSCE station. Physical examination**

### **Palpation of the sigmoid colon**

1. Wash your hands and introduce yourself to the patient. Confirm his/her name and date of birth. Explain the procedure and obtain his/her consent.
2. Ask the patient to undress to the waist and lay on the couch. Ensure that he/she is comfortable.
3. Take a classic position at the patient's bedside: sit on the right side of the patient at the level of his pelvis, face to patient.
4. Before starting deep palpation of the abdomen, ask the patient to breathe calmly, with his mouth open, to relax the abdomen as much as possible. When the abdominal muscles are tense, ask the patient to bend his legs at the knees.
5. During palpation of the sigmoid colon, four moments of palpation are sequentially performed:
  - correct topographic position of the hand;
  - creation of skin fold;
  - dipping in the abdominal cavity during exhalation;
  - sliding palpable movement.
6. Slightly bend the four fingers of the right hand in the first and second interphalangeal joints (to form one line of palpation) and place them on the border of the middle and outer thirds of the *lin. ilioumbilicalis sinistra* parallel to the long axis of the sigmoid colon. Another variant is to place the ulnar edge of the right hand and bent fingers (3-5), creating one line of palpation in the left iliac area parallel to the long axis of the sigmoid colon (oblique palpation).
7. Form a skin fold by moving the skin (without dipping in the abdominal cavity) by 2-3 cm in the direction of the navel.
8. Gradually immerse your fingers in the abdomen on each exhalation (for 2-3 exhalations).
9. Without changing the depth of immersion, make a sliding movement of the fingers 3-6 cm towards the iliac bone.
10. Sliding through the sigmoid colon, determine its diameter (width), consistency, nature of the surface, the presence or absence of rumbling and pain.
11. Finally, you should summarise your findings, and thank the patient.
12. Wash your hands.

## OSCE station. Physical examination

### Palpation of the cecum

1. Wash your hands and introduce yourself to the patient. Confirm his/her name and date of birth. Explain the procedure and obtain his/her consent.
2. Ask the patient to undress to the waist and lay on the couch. Ensure that he/she is comfortable.
3. Take a classic position at the patient's bedside: sit on the right side of the patient at the level of his pelvis, face to patient.
4. Before starting deep palpation of the abdomen, ask the patient to breathe calmly, with his mouth open, to relax the abdomen as much as possible. When the abdominal muscles are tense, ask the patient to bend his legs at the knees.
5. During palpation of the cecum, four moments of palpation are sequentially performed:
  - correct topographic position of the hand;
  - creation of skin fold;
  - dipping in the abdominal cavity during exhalation;
  - sliding palpable movement.
6. Slightly bend the four fingers of the right hand in the first and second interphalangeal joints (to form one line of palpation) and place them on the border of the middle and outer thirds of the *lin. ilioumbilicalis dextra* parallel to the long axis of the cecum. The hand is positioned in the right iliac area so that the *lin. ilioumbilicalis dextra* divided the hand in half lengthwise.
7. Form a skin fold by moving the skin (without dipping in the abdominal cavity) by 2-3 cm in the direction of the navel.
8. Gradually immerse your fingers in the abdomen on each exhalation (for 2-3 exhalations).
9. Without changing the depth of immersion, make a sliding movement of the fingers 3-6 cm towards the iliac bone.
10. Sliding through the cecum, determine its diameter (width), consistency, nature of the surface, the presence or absence of rumbling and pain.
11. Finally, you should summarise your findings, and thank the patient.
12. Wash your hands.

## **OSCE station. Physical examination**

### **Palpation of the liver**

1. Wash your hands and introduce yourself to the patient. Confirm his/her name and date of birth. Explain the procedure and obtain his/her consent.
2. Ask the patient to undress to the waist and lay on the couch. Ensure that he/she is comfortable.
3. Take a classic position at the patient's bedside: sit on the right side of the patient at the level of his pelvis, face to patient.
4. The liver is palpated bimanually. During palpation of the liver, three moments of palpation are carried out:
  - correct topographic position of the hand;
  - dipping in the abdominal cavity during exhalation;
  - sliding palpating movement in which not the hand slips on the organ, and the liver slips on the hand during inhalation.
5. Before palpation of the liver, it is necessary to determine by percussion lower border of the liver along right midclavicular line.
6. Ask the patient to place his forearms and hands on his chest.
7. With the left hand, cover and fix the lower part of the chest so that four fingers go on the back surface at the level of the last two ribs (perpendicular to the spine), and the thumb is on the edge of the costal arch in front.
8. Place your right hand with outstretched fingers flat on the patient's abdomen in the right hypochondrium. Bend the middle finger a little to form one palpating line. The position of the hand in the right hypochondrium should be such that it is 2-3 cm below the defined by percussion lower edge of the liver, and right midclavicular line divided the hand in half.
9. As the patient exhale, immerse your hand in the abdominal cavity to a depth of 2 cm.
10. Ask the patient to take a deep breath with the abdomen.
11. At the moment of slipping of the liver edge on the fingers, evaluate the location of the lower edge of the liver, the nature of the lower edge (shape and consistency), the nature of the surface, and pain.
12. Finally, you should summarise your findings, and thank the patient.
13. Wash your hands.

## ***OSCE station. Recording of 12-lead electrocardiogram***

Electrocardiography (ECG) is the process of recording the electrical activity of the heart over a period of time using electrodes placed on the skin. It is a very commonly performed cardiology test.

Research is conducted after the 15-20 minute rest and not earlier than 30 minutes after a meal. ECG recording is usually performed in the supine position on the back that allows to achieve maximum muscle relaxation of the patient.

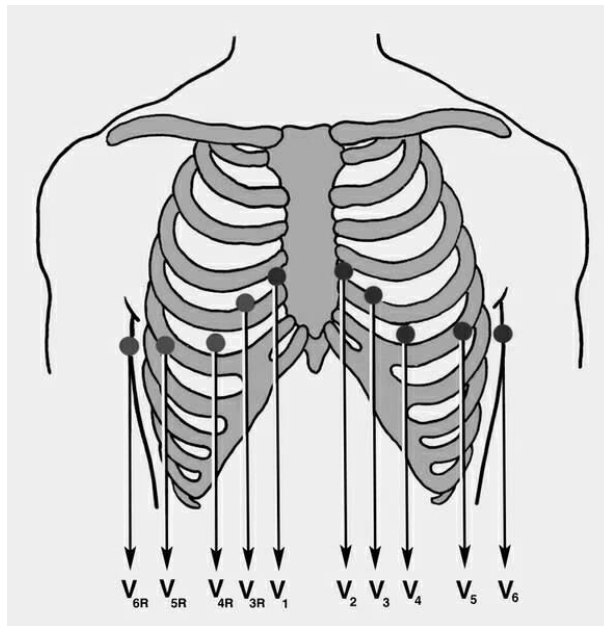
1. Wash your hands and introduce yourself to the patient and clarify his identity.
2. Explain what you are going to do and gain consent to proceed. Clarify whether the patient knows why the test is being performed e.g. chest pain.
3. Ensure the patient is comfortable, for this test the patient must have their top off, ankles should also be freed from clothes.
4. Place 4 plate electrodes on the inner surface of forearms and ankles in their lower third, and place on the chest one or more (with multi-channel recording) precordial electrodes using rubber bulb-sucker.
5. To improve the quality of ECG you should ensure good contact of electrodes with the skin. Use alcohol to degrease the skin in places for electrodes; apply on electrodes a special gel.
6. Although this is called a 12-lead ECG you need only 5-10 electrodes, 4 for the limb leads and 1 or 6 for precordial leads. The limb leads are colored: red, yellow, green and black.

One way to remember is the order of traffic lights. This is where you place them:

- Right wrist (red)
- Left wrist (yellow)
- Left ankle (green)
- Right ankle (black)

The chest leads (electrode with white color) are usually numbered V1-6, attach as shown:

- V1 in 4th intercostal space at right sternal edge
- V2 in 4th intercostal space at left sternal edge
- V3 between V2 and V4
- V4 in 5th intercostal space in the mid-clavicular line
- V5 horizontal to V4 in anterior axillary line
- V6 horizontal to V4 and V5 in mid-axillary line



If ECG machine has 6 channels, precordial leads can be recorded simultaneously and chest electrodes are colored: V1 – red, V2 – yellow, V3 – green, V4 – brown, V5 – black, and V6 – blue or purple.

7. Input the patients data into the machine correctly, thus ensuring the correct details are printed onto the ECG.
8. Switch leads in position "0" and calibrate the record with the 1 mV signal.
9. Once all the leads are attached ask the patient to lie as still as possible and breathe quietly. Record the ECG (i.e. press the record button). First record standard limb leads (I, II, III), then augmented limb leads (aVR, aVL, aVF) and six unipolar precordial leads (V1–V6). Record no less than 4 cardiac cycles PQRST in each lead.
10. Print and label the ECG (write the patient's name, age, date and time of recording).
11. Disconnect the leads. Allow the patient to dress and thank them. Clean the machine's leads and wash your hands.

## ***OSCE station. Cardiopulmonary resuscitation (CPR)***

1. Ensure that the scene is safe either for the victim or for you and other rescuers.
2. Assess the victim's level of consciousness by gently shaking his/her shoulders and asking loudly "Are you OK?" If the victim does not respond, it means that he/she is unconscious.
3. Shout for help.
4. Put the victim on his/her back on a flat, firm surface.
5. To perform the head tilt – chin lift maneuver, place one of your hands on the patient's forehead and apply gentle, firm, backward pressure using the palm of your hand. Place the fingertips of the other hand under the bony part of the chin. To open the airway, lift the chin forward and support the jaw, helping to tilt the head back.
6. Check for breathing: look (observe the movements of the chest), listen (lean over the patient's mouth and listen for sounds of inhalation and exhalation), feel (placing your face and ear over the patient's mouth to feel for any movement of air). At the same time check the pulse at the carotid artery on your side for an adult.
7. You should assess for normal breathing and carotid pulse for no more than 10 seconds, count aloud.
8. Call an ambulance using local emergency number 103.
9. Start chest compressions. Place heel of one hand over the lower half of the patient's sternum, other hand on top, interlock your fingers. Keep your elbows straight and position your shoulders directly above your hands.
10. Compression depth should be 5-6 centimeters, use the heel of your hand.
11. Perform 30 same rhythmic compressions (count aloud, in tens). Push hard at a rate of 100 to 120 compressions a minute ( $\approx 2$  times per second). Allow full chest recoil between compressions but don't take off your hands.
12. Start rescue breathing using the mouth-to-mouth technique. Put on the victim a special face mask with valve to protect yourself.
13. Ensure the head tilt and chin lift are in place, pinch the soft part of the nose so that it is closed.
14. Open the mouth, seal your lips around victim's lips and blow steadily for 1 second. Give 2 breaths (not forced) each lasting 1 second.
15. Verify that the chest rises and falls.
16. When you are giving 2 breaths, intervals between chest compressions should not exceed 10 seconds.
17. In adults you should start with 30 chest compressions followed by 2 rescue breaths and then continue CPR at a ratio of 30:2 compressions to ventilations until either further help arrives, the victim regains consciousness, or you can no longer physically continue.

\*For more details about CPR turn to Supplements at the end of this book.

# SUPPLEMENTS

## SCHEME OF CASE REPORT

### I. INTERVIEWING

#### **1. Identifying Information:**

- Surname, First and Middle Names
- Age, Date of Birth (dd-mmm-yyyy)
- Nationality
- Sex, Marital Status
- Education, Professional Experience
- Name of Present Employer or School, Occupation (if retired or invalid, ask when was registered as disable person and for what reason – old-age, disease, etc.)
- Home Address
- Date of admission to \_\_\_\_\_ Department of \_\_\_\_\_ Hospital

#### **2. Chief Complaints (or the Reason for Seeking Care).**

#### **3. History of Present Illness (Anamnesis morbi):**

- time of onset (when did the patient feel ill for the first time)
- acute or gradual onset, initial symptoms, possible causes of the disease (psychological stress, physical or mental overstrain, infection, cold, etc.)
- course of the disease from the very beginning till present time (describe events in chronologic order, point out exacerbations and remissions, diagnostic results, treatment and its efficiency, and at last immediate reason that prompted the seeking of attention, particularly if the problem has been long-standing).

#### **4. Review of Systems (Anamnesis communis).**

It is probable that all of the questions in each system will not be included every time you take a history. Nevertheless, some questions about each system should be included in each history. The range of these questions is listed in the outline that follows. More comprehensive and detailed questions should be included whenever the patient gives positive responses to the first group of questions for that system.

*General constitutional symptoms:* fever, chills, malaise, fatigability, night sweats, sleep patterns, loss of appetite, weight changes, apathy.

Next is the most affected system.

##### *a) Respiratory System:*

disorder of nasal breathing; coughing, its nature (dry or moist), onset, relationship to time of day, weather, activities, deep breaths; sputum quantity, color, odor, amount of blood; hemoptysis – onset; pain related to respiration or cough, its location, character; fever; night sweats; dyspnea (possible causes);

history of tuberculosis.

##### *b) Cardiovascular System:*

chest pain or distress – its character, location, radiation down arms, to neck, jaws, teeth, scapula; onset and duration; relationship to physical effort, emotional stress or other; relieving factors (rest, nitroglycerin or other);

palpitation, arrhythmia – timing and duration, precipitating and relieving factors; arterial blood pressure (maximum, minimum, and usual);

dyspnea, choke – character, timing, how much aggravated by exertion; orthopnea (number of pillows needed); cough, hemoptysis; heaviness in the right hypochondrium; swelling or edema – when and where appeared, constant or at certain times during day;

past history of acute rheumatic fever, anginas.

*c) Gastrointestinal System:*

abdominal pain – its location, radiation, intensity, character (dull, sharp, burning, stabbing, cramping, colicky, etc.), duration, association with timing of food intake, type of food or bowel movement; relieving factors;

appetite, unpleasant taste in the mouth, dysphagia, belching, heartburn, nausea, vomiting – frequency, relationship to previous meal, medications and other symptoms; vomit character – color, odor, quantity, fresh blood or coffee grounds, bile, undigested food particles; relief after vomiting; rumbling, flatulence; regularity of bowels, constipation, diarrhea, change in stool color or contents (e.g., clay-colored, tarry black, fresh blood, mucus, undigested food); hemorrhoids;

history of hepatitis, jaundice, malaria, ulcer, gallstones.

*d) Genitourinary System:*

pain in the lumbar region – character, radiation to groin and genitals, when appears; dysuria, frequency or volume changes, polyuria, nocturia, hematuria, pain or burning on voiding; urine color (bright red, rusty brown, cola-colored), clarity and odor; libido; incontinence; edema of face.

*For Men:* hesitancy (difficulty starting), poor stream or flow, terminal dribbling, urethral discharge, erectile dysfunction.

*For Women:* last menstrual period, timing and regularity, length of periods; abnormal bleeding, vaginal discharge; contraception.

*e) Nervous System and Psychic State:*

headache, dizziness, noise in the ears, syncope, cramps, tremors, sleep disturbances, loss of memory, mood changes, nervousness, irritability.

*f) Sense Organs:*

vision, hearing, sense of smell, disturbance of taste, sensory function.

*g) Musculoskeletal System:*

pain in joints, bones, muscles; joints stiffness, restriction of motion, swelling, redness, heat, bony deformity; changes of gait, body weight.

## **5. Life History (*Anamnesis vitae*):**

*Past Medical History* (in chronologic order): childhood and major adult illnesses; surgery; serious injuries, resulting in disability; infectious diseases (tuberculosis, hepatitis, syphilis, typhus, malaria, etc.); immunizations; medications, reactions to blood transfusions.

*For Women:* menses (onset, regularity, duration and amount of flow, dysmenorrhea), pregnancies, miscarriages, abortions, each type of delivery, use of contraceptives, age at menopause, breasts (pain, tenderness, discharge, lumps, mammograms, frequency of self-examination).

*Drug History:* prescribed drugs and any other medications; allergies to medications, foods, and environmental allergens.

*Family History:* illnesses of any blood relatives with features similar to the patient's illness; ethnicity, health and, if applicable, the cause of death of parents and siblings; age and health of patient's wife (husband) and children.

Special attention should be paid to heart diseases, high blood pressure, cancer, tuberculosis, stroke, epilepsy, diabetes, gout, kidney disease, thyroid disease, asthma and other allergic states, forms of arthritis, blood diseases, sexually transmitted diseases, or any other familial disease.

*Personal and Social History:* birthplace, where raised, home environment as youth, progress at school, education, military record;

description of usual work, list of job changes, work conditions and hours, physical or mental strain, exposure to heat and cold or industrial toxins (especially lead, arsenic, chromium, asbestos, beryllium, poisonous gases, benzene, and polyvinyl chloride, etc.) or other harmful influences;

home conditions; position in family, marital status; nutrition and diet; exercise;  
harmful habits: smoking (duration, how many cigarettes a day), alcohol or narcotics usage  
(how often and dosage), abuse of coffee, tea, etc.; prolonged using of some remedies.

## **PHYSICAL EXAMINATION**

### **II. General Inspection:**

General appearance of a patient (corresponding to age, looking older or younger)  
General condition (satisfactory, serious, very serious, grave, agony)  
Consciousness (clear, stupor, sopor, coma, delirium, hallucinations)  
Postition of a patient (active, passive, or forced – describe what kind of forced posture)  
Face, its expression, color of the lips and cheeks  
Carriage (erect posture, slender or stooped figure, free or constrained movements)  
Gait (easy, waddling, peculiar to hemiplegia or sciatica)  
Body-built (regular, irregular). Height (cm). Weight (kg)  
Constitutional type (normosthenic, hypersthenic, or asthenic)  
Skin (color; eruptions; hemorrhages, scars, etc.; elasticity, moisture); hair; nails  
Mucous membranes (conjunctiva, oral and nasal mucosa – color, eruptions, spots)  
Subcutaneous fat (moderate, excessive, or deficient; distribution; thickness of the skin fold; edema, subcutaneous emphysema)  
Lymph nodes (submandibular, cervical, supra- and subclavicular, axillary, ulnaris, inguinal, popliteal, etc.), their size, consistence, tenderness, mobility, fusing with surrounding tissues and skin  
Head (position, shape, size, movements, symmetry, etc.)  
Eyes (eye slits; eyelids; scleras; pupils, their shape, size, symmetry, response to light; accommodation and convergence)  
Nose (shape, size, tenderness, color of the skin, nasal breathing)  
Ears (shape, size, tenderness, color of the skin, nodules)  
Mouth (odor, shape, lips symmetry; movements; oral mucous membrane; gums, teeth, tongue, tonsils)  
Neck (shape, pulsations; thyroid gland, its size)  
Voice, its sonority, hoarseness  
Extremities (proportionality to the trunk, paralysis, cramps, tremor, clubbing of the fingers and toes, varicosity of the veins)  
Muscles (development, tone, tenderness, muscular strength)  
Bones (deformities, tenderness on palpation and percussion, pathologic mobility)  
Joints (shape, color and temperature of the skin, swelling, active and passive movements, tenderness in movements, crackles)

### **III. Examination of Systems** (the most affected system should be first)

#### ***1. Examination of Respiratory System***

##### ***a) Inspection of the chest:***

Shape of the chest: normosthenic, asthenic, hypersthenic, emphysematous (barrel), paralytic, rachitic, funnel, foveated, kyphotic, lordotic, kyphoscoliotic (describe the signs of appropriate shape, anteroposterior versus transverse diameter).

Size and symmetry of the chest; enlargement, diminution, deformity of one half of the chest; smoothing and protrusion of intercostal spaces; asymmetry of the clavicles and shoulder blades.

Symmetry of chest movement with respiration, unilateral lagging, presence of retractions, use of accessory muscles.

Respiratory rate, depth (superficial or deep), type (thoracic, abdominal, mixed), and rhythm (regular, Kussmaul's, Cheyne-Stokes or Biot's respiration); dyspnea (inspiratory, expiratory, mixed).

*b) Palpation of the chest:*

Tenderness of the clavicles, sternum, ribs and intercostal spaces.

Elasticity (resilience) of the chest.

Pleura friction rub, rales and other sounds which may be palpable.

Symmetry and quality of tactile (vocal) fremitus - increased, decreased or absent, describe location of findings.

*c) Percussion of the lungs:*

*Comparative:* quality and symmetry of percussion sounds (resonance, tympanic, hyperresonance, metallic, dull, flat) on symmetrical points of the chest (supra- and subclavicular, axillary, supra-, intra- and subscapular), describe location of findings.

*Topographic:* determining the lower borders of the lungs, active and passive mobility of the lower borders, the upper level of lungs' apices (anteriorly and posteriorly), determining the width of Kroenig's area, topography of Traube's semilunar space.

*d) Auscultation of the lungs:*

Characteristics of main and adventitious breath sounds (vesicular and bronchial breathing, pathologic bronchial breathing, dry and moist rales, crepitation, pleural friction rub).  
Bronchophony.

## **2. Examination of Cardiovascular System**

*a) Inspection of the precordium and peripheral vessels* (cardiac "hump-back", pulsations, thrills, heaves, or lifts).

*b) Palpation of the vessels* (examination of pulse on the radial artery, etc.).

*c) Palpation of the precordium* (clockwise: apical impulse, epigastric pulsation, pulsations of the aorta and pulmonary trunk, etc.).

*d) Percussion of the heart:* determination of right, upper, and left borders of the relative and absolute cardiac dullness, borders of the vascular bundle.

*e) Auscultation of the heart* (the area of the apical impulse, the lower part of the sternum near its junction with the xiphoid process, the second intercostal spaces to the right and left of the sternum, the Botkin-Erb point): heart rhythm and rate, characteristics of the heart sounds (location, intensity, pitch, timing, splitting, adventitious sounds, pathological rhythms), presence of murmurs (systole, diastole, location, radiation, intensity, pitch, quality, variation with respiration).

*f) Auscultation of the vessels* (bruits, venous hum).

*g) Blood pressure measuring* (on the brachial and femoral arteries).

## **3. Examination of Abdomen**

*a) Mouth* (odor, oral mucosa, gums, teeth, tongue, tonsils).

*b) Inspection of the abdomen* (patient standing and supine): shape, contour, symmetry, umbilicus, surface motion, visible peristalsis, scars, pigmentations, hernia, venous patterns.

*c) Auscultation of the abdomen* (bowel sounds, bruits, friction rub).

*d) Percussion of the abdomen:* character of the tone in each quadrant, presence of free fluid, and the sign of fluid fluctuation.

*e) Surface palpation of the abdomen:* tenderness, muscle resistance; hernia or separation of muscles, tumours; Shchetkin-Blumberg sign, Mendel sign.

*f) Deep methodical sliding palpation according to Obrastsov and Strazhesko:* examination of the intestine (the sigmoid, cecum, terminal part of the ileum, appendix, ascending and descending colon, transverse colon) - tenderness, mobility, consistency, diameter, surface, absence or presence of rumbling sounds;

determination of the inferior border of the stomach, palpation of the greater curvature and pylorus;

liver: percussion is used to determine the superior (in 3 lines) and inferior (in 5 lines) borders of liver dullness, liver size according to Obraztsov, or Kurlov; palpation of the liver (lower edge, surface, consistency, tenderness);

the gall bladder: specific pain signs;

pancreas: pain determined by palpation in specific zones and points;

spleen: determination of the borders and size by percussion, palpation;

kidney palpation, Pasternatsky's sign, tenderness points for the ureters, palpation and percussion of the urine bladder.

#### **IV. Presume diagnosis and its explanation**

(aggregate all findings, subjective and objective, related to the same body system to help identify the domain of the disorder, and determine the main clinical syndromes).

#### **V. List the diagnostic laboratory tests, instrumental studies or consultations needed to confirm the presumed diagnosis.**

List of the routine laboratory tests and instrumental studies in a hospital:

- Routine blood analysis (complete blood count, hemoglobin, ESR)
- Urinalysis
- Stool examination
- Biochemical blood profile (specific parameters may change for each pathology, for example, cholesterol, fasting lipid panel, glucose, creatinine, urea, K and Na, total protein, albumin, globulin, A/G coefficient and so on).
- Chest x-ray
- Resting 12-lead ECG
- Sonography of the abdomen (specify what organs to examine)

## Glasgow Coma Scale

| Activity               |                                                                   | Score |
|------------------------|-------------------------------------------------------------------|-------|
| <b>Eye Opening</b>     |                                                                   |       |
| None                   | 1 = Even to supraorbital pressure                                 |       |
| To pain                | 2 = Pain from sternum/limb/supraorbital pressure                  |       |
| To speech              | 3 = Nonspecific response, not necessarily to command              |       |
| Spontaneous            | 4 = Eyes open, not necessarily aware                              | _____ |
| <b>Motor Response</b>  |                                                                   |       |
| None                   | 1 = To any pain; limbs remain flaccid                             |       |
| Extension              | 2 = Shoulder adducted and shoulder and forearm internally rotated |       |
| Flexor response        | 3 = Withdrawal response or assumption of hemiplegic posture       |       |
| Withdrawal             | 4 = Arm withdraws to pain, shoulder abducts                       |       |
| Localizes pain         | 5 = Arm attempts to remove supraorbital/chest pressure            |       |
| Obeys commands         | 6 = Follows simple commands                                       | _____ |
| <b>Verbal Response</b> |                                                                   |       |
| None                   | 1 = No verbalization of any type                                  |       |
| Incomprehensible       | 2 = Moans/groans, no speech                                       |       |
| Inappropriate          | 3 = Intelligible, no sustained sentences                          |       |
| Confused               | 4 = Converses but confused, disoriented                           |       |
| Oriented               | 5 = Converses and is oriented                                     | _____ |
| TOTAL (3-15)*          |                                                                   |       |

\*Interpretation: Patients with scores of 3-8 usually are considered to be in coma.

Source: Teasdale G., Jennett B. Assessment of coma and impaired consciousness. A practical scale. *Lancet*. 1974; 304(7872):81.

## Classification of Overweight and Obesity by BMI, Waist Circumference, and Associated Disease Risks

|                            |                                   |                          | <b>Disease Risk* Relative to Normal Weight and Waist Circumference#</b>   |                                                             |
|----------------------------|-----------------------------------|--------------------------|---------------------------------------------------------------------------|-------------------------------------------------------------|
|                            | <b>BMI<br/>(kg/m<sup>2</sup>)</b> | <b>Obesity<br/>Class</b> | <b>Men 102 cm<br/>(40 in) or less<br/>Women 88 cm<br/>(35 in) or less</b> | <b>Men &gt; 102 cm (40 in)<br/>Women &gt; 88 cm (35 in)</b> |
| <b>Underweight</b>         | < 18.5                            |                          | —                                                                         | —                                                           |
| <b>Normal</b>              | 18.5–24.9                         |                          | —                                                                         | —                                                           |
| <b>Overweight</b>          | 25.0–29.9                         |                          | Increased                                                                 | High                                                        |
| <b>Obesity</b>             | 30.0–34.9                         | I                        | High                                                                      | Very High                                                   |
|                            | 35.0–39.9                         | II                       | Very High                                                                 | Very High                                                   |
| <b>Extreme<br/>Obesity</b> | ≥ 40.0                            | III                      | Extremely High                                                            | Extremely High                                              |

\* Disease risk for type 2 diabetes, hypertension, and CVD.

# Increased waist circumference also can be a marker for increased risk, even in persons of normal weight.

Metric conversion formula = weight (kg)/height (m)<sup>2</sup>

Example of BMI calculation: A person who weighs 78.93 kilograms and is 177 centimeters tall has a BMI of 25: weight (78.93 kg)/height (1.77 m)<sup>2</sup> = 25

Non-metric conversion formula = [weight (pounds)/height (inches)<sup>2</sup>] x 703

Example of BMI calculation: A person who weighs 164 pounds and is 68 inches (or 5' 8") tall has a BMI of 25: [weight (164 pounds)/height (68 inches)<sup>2</sup>] x 703 = 25

Source: NIH and NHLBI: Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report. NIH Publication 98-4083. September 1998. Available at [https://www.nhlbi.nih.gov/files/docs/guidelines/ob\\_gdlns.pdf](https://www.nhlbi.nih.gov/files/docs/guidelines/ob_gdlns.pdf)

Use BMI Calculator at [https://www.nhlbi.nih.gov/health/educational/lose\\_wt/BMI/bmi-m.htm](https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmi-m.htm).

## **Cardiopulmonary resuscitation (CPR), basic life support (BLS)**

**1. Ensure that the scene is safe either for the patient or for you (and other rescuers).** Eliminate possible threats (if necessary call the appropriate services, e.g., police, firefighters).

**2. Assess the victim's level of consciousness** by gently shaking the patient's shoulders and asking loudly "Are you OK?" If the patient does not respond, it means that he is unconscious.

**3. Call for help.** If you are alone or you do not have a mobile phone, leave the victim to call for ambulance or emergency medical services before the cardiopulmonary resuscitation (CPR). Otherwise, send someone for help and immediately start CPR.

### **4. Check for breathing and circulation**

Check for breathing:

- look (observe the movements of the chest),
- listen (lean over the patient's mouth and listen for sounds of inhalation and exhalation),
- feel (placing your face and ear over the patient's mouth to feel for any movement of air).

At the same time check the pulse at the carotid artery on your side for an adult, at the femoral artery - for an infant.

You should assess for normal breathing and carotid pulse for no more than 10 seconds.

The absence of chest movements, breathing sounds and feeling of air movement indicates apnea, which can result from cardiac arrest or complete obstruction of the airways, inhibition of the respiratory center or respiratory diseases in case of preserved spontaneous circulation.

Agonal (terminal) breathing should be assessed as apnea.

Sounds that accompany breathing may indicate partial obstruction of the airways (gurgling - the presence of liquid or semi-liquid content in the airways [vomiting, blood, discharge from the respiratory tract], snoring - overlapping of throat by tongue, palate or foreign body, stridor - obstruction at the glottis) - clear the airway.

If a patient is breathing normally, and pulse is present then the patient should be placed in the recovery position and monitored. If pulse is present but a patient is not breathing, provide rescue breathing at a rate of 10 breaths per minute without chest compressions and check for signs of circulation and pulse every 2 minutes.

The absence of circulation signs (spontaneous movements, coughing, breathing) and carotid pulse means cardiac arrest and need immediate CPR; during CPR every 2 minutes recheck signs of circulation and pulse.

The procedure of cardiopulmonary resuscitation is performed as the C - A - B of basic life support:

C (circulation)

A (airway open)

B (breath for victim)

### **5. C. Start chest compressions:**

Put the patient on his back on a flat, firm surface.

Place heel of one hand over the lower half of the patient's sternum, other hand on top, interlock your fingers (make sure that the pressure will not fall on the victim's ribs). Keep your elbows straight and position your shoulders directly above your hands.

Use your upper body weight (not just your arms) as you push straight down on the chest. Depress the sternum 5-6 centimeters (for adults) and release the pressure. Push hard at a rate of 100 to 120 compressions a minute ( $\approx 2$  times per second). Allow full chest recoil between compressions but don't take off your hands.

Compressions and intervals between them should take approximately the same time.

In adults you should start with 30 chest compressions followed by 2 rescue breaths and then continue CPR at a ratio of 30:2 compressions to ventilations.

### **6. A. Open airway**

You may discover foreign material or vomitus in the mouth that needs to be removed. Do not spend very much time to perform this task. Liquids or semiliquids should be wiped out with the index and middle finger covered by a piece of cloth. Solid material should be extracted with a hooked index finger. It is necessary to remove dentures.

Perform the head tilt (unless there is any chance of cervical spine injury) and jaw thrust to open the airway.

To perform the head tilt-chin lift maneuver, place one of your hands on the patient's forehead and apply gentle, firm, backward pressure using the palm of your hand. Place the fingers of the other hand under the bony part of the chin. Lift the chin forward and support the jaw, helping to tilt the head back.

The jaw-thrust maneuver is accomplished by kneeling near the top of the victim's head, grasping the angles of the patient's lower jaw, and lifting with both hands, one on each side. This will displace the mandible (jawbone) forward while tilting the head backward. This maneuver will keep the mouth open and lift the patient's tongue away from the back of the throat and provide an adequate airway.

### **7. B. Breathe for victim (rescue breathing)**

Attempt to administer two rescue breaths using the mouth-to-mouth technique, or a bag-valve-mask. The mouth-to-mouth technique is no longer recommended, unless a face shield is present. Ensure the head tilt and jaw thrust are in place, pinch the soft part of the nose so that it is closed, open the mouth, seal your lips around theirs and blow steadily for 1 second. Verify that the chest rises and falls; if it does not, reposition (i.e. re-open) the airway using the appropriate technique and try again.

Once the 2 breaths are given, return to giving 30 chest compressions. If there is anyone who can assist, you should share out the work. One of you should perform the breaths and the other the compressions, swapping when tired.

You should continue this cycle of 2 rescue breaths and 30 chest compressions until either further help arrives, the patient regains consciousness, or you can no longer physically continue.

### **Summary of CPR elements for persons, who provide Basic Life Support**

| <b>Element</b>                       | <b>Adult and child</b>                                                                                                                                                                                                                                                        |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ensure scene safety</b>           | Ensure that the scene is safe either for the patient or for you (and other rescuers)                                                                                                                                                                                          |
| <b>Recognition of cardiac arrest</b> | <ul style="list-style-type: none"><li>• Assess the victim's responsiveness</li><li>• No breathing or only gasping</li><li>• Pulse is not clearly defined for 10 seconds (check for breathing and pulse can be performed simultaneously for no more than 10 seconds)</li></ul> |
| <b>Call for help</b>                 | <ul style="list-style-type: none"><li>• If you are alone or you do not have a mobile phone, leave the victim to call for ambulance or emergency medical services before CPR</li><li>• Otherwise, send someone for help and immediately start CPR</li></ul>                    |
| <b>Compression/ventilation ratio</b> | 30:2<br>single rescuer or two rescuers, pause for ventilation with unprotected airway                                                                                                                                                                                         |
| <b>Compression rate</b>              | 100–120/minute                                                                                                                                                                                                                                                                |

|                              |                                                                                                                                                               |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Compression depth</b>     | 5–6 cm                                                                                                                                                        |
| <b>Compression landmarks</b> | 2 hands on lower half of sternum                                                                                                                              |
| <b>Chest release</b>         | <ul style="list-style-type: none"> <li>• Allow full chest recoil after each compression</li> <li>• Do not lean on the chest after each compression</li> </ul> |
| <b>Minimizing intervals</b>  | Intervals between chest compressions should not exceed 10 seconds                                                                                             |

**Information about what should and should not include Basic Life Support as part of effective CPR in adults (AHA recommendations, 2015)**

| <b>Rescuer should do</b>                                                                                                                            | <b>Rescuer should not do</b>                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Perform chest compressions at a rate of 100–120/minute                                                                                              | Perform chest compressions at a rate of less than 100 or more than 120/minute |
| Ensure compression depth of 5–6 cm                                                                                                                  | Ensure compression depth less than 5 or more than 6 cm                        |
| Allow full chest recoil after each compression                                                                                                      | Lean on the chest after each compression                                      |
| Shorten the intervals between chest compressions                                                                                                    | Interrupt chest compressions for more than 10 seconds                         |
| Conduct rescue breathing properly<br>(2 breaths after 30 chest compressions, each breath lasting 1 second, chest rises and falls with every breath) | Allow hyperventilation<br>(very frequent or very deep breaths)                |

**You can stop CPR:**

- 1) in case of restored circulation and appearance of pulse on large arteries and / or restored spontaneous breathing;
- 2) if resuscitation is not effective for 30 minutes;
- 3) if death of heart occurs – stable electric asystole at least for 30 minutes (straight line on the ECG), despite CPR and medications;
- 4) if signs of biological death are revealed.

## References

1. Bates' guide to physical examination and history taking / Ed. by L.S. Bickley, P.G. Szilagyi, R.M. Hoffman. – 12th ed. – Wolters Kluwer, 2017. – 1034 p.
2. Goldman-Cecil Medicine (Cecil Textbook of Medicine) / Ed. by Lee Goldman, Andrew Schafer. – 26th ed. – 2019. – Vol.1. – 3024 p.
3. Clinical Skills for OSCEs / Ed. by Neel Burton. – 5th ed. – Scion, 2015. – 344 p.
4. Davidson's Principles & Practice of Medicine / Ed. Ch. Haslett et al. – 22nd ed., international edition. – Edinburgh ; London : Churchill Livingstone, 2014. – 1392 p.
5. Kondratiuk V.Ye., Khomaziuk V.A. Practice in Patient Care at the Therapeutic Department of a Hospital: Workbook. Clinical manual. – Kyiv: AUS Medicine Publishing, 2020. – 112 p.
6. Kumar and Clark's Clinical Medicine / Ed.: P. Kumar, M. Clark. – 9th ed., international edition. – Edinburgh; London: Saunders/Elsevier, 2016. – 1456 p.
7. Macleod's Clinical Examination / Ed. by G. Douglas, F. Nicol, C. Robertson. – 13th ed. – Elsevier, 2013. – 472 p.
8. Propedeutics to Internal Medicine: textbook for English learning students of higher medical school. Part 1. Diagnostics / O.M. Kovalyova, T.V. Ashcheulova. – 4th ed. – Vinnytsia: Nova Knyha, 2019. – 417 p.
9. Propedeutics of internal medicine: textbook for English learning students of higher medical schools. Part 2. Syndromes and diseases / O.M. Kovalyova, S.O.Shapovalova, O.O. Nizhegorodtseva. - 4th ed. - Vinnytsia: Nova Knyha, 2019. – 258 p.
10. Seidel's Guide to Physical Examination/ Jane Ball, Joyce Dains, John Flynn et al. – 8th ed. – Mosby, 2014. – 736 p.
11. Teasdale G., Jennett B. Assessment of coma and impaired consciousness. A practical scale// Lancet. – 1974. – Vol.304, issue 7872. – P.81-84. DOI:10.1016/S0140-6736(74)91639-0
12. 2018 ESH/ESC Guidelines for the management of arterial hypertension // European Heart Journal. – 2018. – Vol.39 (33). – P.3021–3104. DOI:10.1093/eurheartj/ehy339
13. Blood Pressure Simulator. Easy Auscultation website. Available at <https://www.easyauscultation.com/taking-blood-pressure>
14. BMI Calculator. Available at [https://www.nhlbi.nih.gov/health/educational/lose\\_wt/BMI/bmi-m.htm](https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmi-m.htm).
15. LearnDerm website. Available at <https://www.visualdx.com/learnderm/>
16. Medistudents website. OSCE skills. Available at: <https://www.medistudents.com/en/learning/osce-skills/>
17. NIH and NHLBI: Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report. NIH Publication 98-4083. September 1998. Available at [https://www.nhlbi.nih.gov/files/docs/guidelines/ob\\_gdlns.pdf](https://www.nhlbi.nih.gov/files/docs/guidelines/ob_gdlns.pdf)