Ministry of Health of Ukraine
Odesa National Medical University

# ENGLISH FOR PROFESSIONAL PURPOSES

## Study guide
## to practical classes for the 3rd year students
## of higher education in medicine

Odesa
ONMedU
2023

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***Authors:***

O. V. Kyriazova — Cand. of Ped. Sciences, Associate Professor of Phylosophy, Bioethics and Foreign Languages Department of Odesa National Medical University MH Ukraine

V. Ye. Abramovych — Cand. of Ped. Sciences, Associate Professor of Phylosophy, Bioethics and Foreign Languages Department of Odesa National Medical University MH Ukraine

A. I. Levytska — Cand. of Ped. Sciences, lecturer of Phylosophy, Bioethics and Foreign Languages Department of Odesa National Medical University MH Ukraine

A. A. Tsyba — lecturer of Phylosophy, Bioethics and Foreign Languages Department of Odesa National Medical University MH Ukraine

***Reviewers:***

O. O. Sikorska — PhD in Philology, Associate Professor, Head of Social Sciences Department of Odesa National Medical University MH Ukraine

E. V. Stryga — Cand. of Ped. Sciences, Associate Professor of Western and Oriental Languages and Methods of Their Teaching Department of State Institution "South Ukrainian National Pedagogical University named after K. D. Ushynsky"

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The materials of the textbook are focused on the development of skills in working with medical texts in English. Attention is focused on the peculiarities of the use of medical terminology in professional materials and the specifics of their translation, which contributes to increasing the level of preparation for the processing of foreign medical literature. For each topic in English, there are: relevant keywords for study, tests for consideration, analysis, translation and exercises for the practical application of the acquired knowledge. The content of the textbook corresponds to the current work program in the discipline.

For students of the 3rd year of study at the school of medicine.

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# CONTENTS

# ПЕРЕДМОВА

Зважаючи на сучасні реалії, знання іноземних мов є актуальною передумовою для налагодження особистих і професійних контактів серед працівників медичної сфери. Проблеми, що виникають при спілкуванні та співпраці між країнами і людьми з різними мовними й культурними традиціями, потребують суттєвих змін у підході до викладання іноземних мов у закладах вищої медичної освіти.

Завдання навчально-методичного посібника полягає в ознайомленні майбутніх лікарів з особливостями перекладу фахових матеріалів з англійської мови. Термінологічна та нетермінологічна лексика семантизується за допомогою дефініцій англійською мовою, що допоможе здобувачам вищої освіти працювати з англомовною довідковою літературою. Крім того, така робота з лексикою сприятиме засвоюванню фахового вокабуляру, тобто іншомовної лексики, яка постійно використовується у спілкування між спеціалістами медичної сфери. Навчально-методичний посібник містить змістовний матеріал згідно з чинною робочою програмою з дисципліни «Іноземна мова за професійним спрямуванням» для здобувачів вищої освіти 3-го року навчання медичного факультету. Колективом авторів було обрано найактуальніші медичні теми для розгляду та аналізу: Анатомія, Біологія, Гістологія, Фізіологія, Мікробіологія, Біохімія, Фармакологія тощо.

Основною метою видання є навчити здобувачів вищої освіти оперувати й активно використовувати іншомовну лексику у процесі синтезу і аналізу різноманітних фахових джерел інформації, читати, перекладати (з англійської на українську та навпаки), інтерпретувати та аналізувати автентичні англомовні фахові матеріали.

# PREFACE

Taking into account modern realities, knowledge of foreign languages is an actual point for making personal and professional contacts in the medical field. Problems arising in communication and cooperation between countries and people with different linguistic and cultural traditions require significant changes in the approach to teaching foreign languages in higher medical institutions.

The task of this manual is to introduce future doctors to the peculiarities of translating professional materials from the English language. Terminological and non-terminological vocabulary is semanticized with the help of definitions in English, which will help students of higher education to work with English-language reference literature. In addition, this kind of work with vocabulary helps to learn professional vocabulary, that is, foreign language vocabulary which is constantly used in communication between specialists in the medical field. This manual contains material in accordance with the current work program for the discipline "Foreign language for professional direction" for students of higher education in the 3rd year of study at the medical faculty. The team of authors selected the most relevant medical topics for consideration and analysis: Anatomy, Biology, Histology, Physiology, Microbiology, Biochemistry, Pharmacology, etc.

The main goal of the publication is to teach students of higher education to operate and actively use foreign language vocabulary in the process of synthesis and analysis of various specialized sources of information, to read, translate (from English to Ukrainian and vice versa), interpret and analyze authentic English-language specialized materials.

# *UNIT 1*
# ANATOMY

## Chapter I

**Exercise 1. Key words**

| Noun | Verb | Adjective | Adverb |
|---|---|---|---|
| chin | accompany | abdominal | below |
| cold | cause | affected | during |
| condyle | complicate | carotid | except |
| fracture | damage | dense | in order to |
| injury | impair | extrauterine | unless |
| insufficiency | ligate | femoral | while |
| jaundice | result from | following | |
| lesion | reveal | immobile | |
| omentum | suffer | lumbar | |
| pregnancy | suspect | ovarian | |
| rupture | undergo | peritoneal | |
| thigh | | uterine | |
| thumb | | | |

**Exercise 2. Read the tests.**

1. A patient has a right-sided fracture in the region of the frontal third of mandible accompanied by a haematoma in the region of chin. It is caused by the injury of the following artery:

A. Mental
B. Inferior labial
C. Lingual
D. Facial
E. Palatine

2. Children often have heavy nasal breathing resulting from excessive development of lymphoid tissue of pharyngeal mucous membrane. What tonsils growth may cause this effect?

A. *Tonsilla pharyngea*
B. *Tonsilla palatina*
C. *Tonsilla lingualis*

D. *Tonsilla tubaria*
E. All above mentioned

3. In the course of laparotomy a surgeon revealed gangrenous lesion of descending colon. It was caused by thrombosis of the following artery:
A. Sinister colic
B. Median colic
C. Dexter colic
D. Ileocolic
E. Superior mesenteric artery

4. As a result of a cold a patient has the abnormal pain and temperature sensitivity of the frontal 2/3 of his tongue. Which nerve must have been damaged?
A. Trigeminus
B. Sublingual
C. Accessory
D. Vagus
E. Glossopharyngeal

5. A patient with a stab wound of the anterior stomach wall is in surgical care. What formation of abdominal cavity did the stomach contents get into?
A. Antegastrial bursa
B. Omental bursa
C. Hepatic bursa
D. Left mesenteric sinus
E. Right mesenteric sinus

6. A patient has tissue ischemia below the knee joint accompanied with intermittent claudication. What artery occlusion should be suspected?
A. Popliteal artery
B. Peroneal artery
C. Posterior tibial artery
D. Anterior tibial artery
E. Proximal part of femoral artery

7. After a trauma of soft tissues in the region of the posterior surface of medial condyle of humerus a patient has got a skin prickle of medial forearm surface. Which of the listed nerves is located in the affected region?

A. *N. ulnaris*
B. *N. musculocutaneus*
C. *N. dorsalis scapularis*
D. *N. subscapularis*
E. *N. radialis*

8. A female patient with a tumour of pancreas has developed mechanic jaundice resulting from compression of a bile-excreting duct. Which duct is compressed?
A. *Ductus choledochus*
B. *Ductus cysticus*
C. *Ductus hepaticus communis*
D. *Ductus hepaticus dexter*
E. *Ductus hepaticus sinister*

9. A 28-year-old woman has been diagnosed with extrauterine pregnancy complicated by the fallopian tube rupture. The blood is most likely to penetrate the following peritoneal space:
A. Rectouterine
B. Vesicouterine
C. Right mesenteric sinus
D. Left mesenteric sinus
E. Intersigmoid sinus

10. Examination of a 2-year-old child revealed physical developmental lag, the child often has pneumonias. The child was diagnosed with nonclosure of *ductus arteriosus*. Haemodynamics disorder was caused by the intercommunication of the following vessels:
A. Aorta and pulmonary trunk
B. Pulmonary trunk and pulmonary veins
C. Superior cava and aorta
D. Superior cava and pulmonary trunk
E. Aorta and pulmonary veins

11. Inflammation of the tympanic cavity (purulent otitis media) was complicated by inflammation of mammillary process sockets. What wall of tympanic cavity did the pus penetrate into the sockets through?
A. Posterior
B. Anterior

C. Medial
D. Lateral
E. Superior

12. It is necessary to take the cerebrospinal fluid from a patient with suspected inflammation of brain tunics. Diagnostic puncture was performed between the arches of the lumbar vertebrae. During the puncture the needle went through the following ligament:
A. Yellow (flaval)
B. Iliolumbar
C. Anterior longitudinal
D. Posterior longitudinal
E. Intertransverse

13. Nowadays about 50 minor bases have been found in the t-RNA structure besides the main four nitrogenous bases. Choose the minor nitrogenous base:
A. Dihydrouracil
B. Uracil
C. Cysteine
D. Adenine
E. Cytosine

14. After a collision of two cars, one of the drivers presents with a deformity in the middle third of the left shin. The driver feels extreme pain that exacerbates on attempts to move it. The ends of a broken bone protrude from the open wound, the bone is triangular in section, movements cause the bleeding to intensify. What bone was damaged?
A. Tibia
B. Fibula
C. Femur
D. Patella
E. Talus

15. An old woman was hospitalized with acute pain, edema in the right hip joint; the movements in the joint are limited. Which bone or part of it was broken?
A. The neck of the thigh
B. The body of the thigh bone

C. Condyle of the thigh
D. Pubic bone
E. Ischial bone

16. A 53-year-old female patient was diagnosed with liver rupture resulting from a blunt abdominal injury. The escaped blood will be assembled in the following anatomic formation:
A. Rectouterine pouch
B. Vesicouterine pouch
C. Right mesenteric sinus
D. Omental bursa
E. Left mesenteric sinus

17. A patient complains about edemata of legs, skin cyanosis, small ulcers on one side of the lateral condyle. Examination revealed a swelling, enlarged veins, formation of nodes. The pathological process has started in the following vein:
A. *V. saphena parva*
B. *V. saphena magna*
C. *V. femoralis*
D. *V. profunda femoris*
E. *V. iliaca externa*

18. A 70-year-old female patient was diagnosed with fracture of left femoral neck accompanied by disruption of ligament of head of femur. The branch of the following artery is damaged:
A. Obturator
B. Femoral
C. External iliac
D. Inferior gluteal
E. Internal pudendal

19. A woman underwent an operation on account of extrauterine (tubal) pregnancy. In the course of the operation the surgeon should ligate the branches of the following arteries:
A. Uterine and ovarian
B. Superior cystic and ovarian
C. Inferior cystic and ovarian
D. Uterine and superior cystic
E. Uterine and inferior cystic

20. A 6-month-old baby ill with bronchitis was taken for an X-ray of the chest. Apart of changes associated with bronchi the X-ray film showed a shadow of the thymus gland. What might have caused such changes?

A. The above-mentioned condition is a normal variant for this age
B. It's the effect of bronchitis
C. It is caused by abnormal position
D. It is caused by thymus inflammation
E. It is caused by neoplastic process

21. During the surgery for a femoral hernia, the doctor operates within the borders of the femoral triangle. What structure forms its upper border?

A. *Lig. inguinale*
B. *Lig.lacunare*
C. *Lig. pectinale*
D. *Arcus iliopectineus*
E. *Fascia lata*

22. A patient has a trauma of the knee joint with a crushed patella. With such injury, it is likely that the tendon of a certain thigh muscle is damaged. Name this muscle.

A. Quadriceps muscle of the thigh
B. Biceps muscle of the thigh
C. *Adductor longus* muscle
D. *Adductor magnus* muscle
E. *Sartorius* muscle

23. A patient complained about being unable to adduct and abduct fingers in the metacarpophalangeal articulations towards and away from the 3rd finger. Which muscles function is impaired?

A. Interosseous muscles
B. Lumbrical muscles
C. Breviflexors of fingers
D. Long flexors of fingers
E. Extensors

24. While examining foot blood supply a doctor checks the pulsation of a large artery running in the separate fibrous channel in front of *Articulatio Talocruralis* between the tendons of long extensor muscles of hallux and toes. What artery is it?

A. *A. dorsalis pedis*
B. *A. tibialis anterior*
C. *A. tarsea medialis*
D. *A. tarsea lateralis*
E. *A. fibularis*

25. Microspecimen of spinal cord contains a nucleus that should be analyzed. Its neurons form motor endings in the skeletal muscles. What nucleus of spinal cord is meant?
A. Proper nucleus of the anterior horn
B. Thoracic nucleus
C. Intermediate lateral nucleus
D. Proper nucleus of the posterior horn
E. Proper nucleus of gray substance

26. A man with cut wound of his right foot sole was admitted to the hospital ward. The patient has limited elevation of the lateral foot edge. In the course of wound processing the injury of a muscle tendon was revealed. What muscle is injured?
A. Long peroneal
B. Anterior tibial
C. Long extensor muscle of toes
D. Triceps muscle of crus
E. Short peroneal

27. A comminuted fracture of infraglenoid tubercle caused by shoulder joint injury has been detected during X-ray examination of a patient. What muscle tendon attached at this site has been damaged?
A. Long head of *m. triceps brachii*
B. Long head of *m. biceps brachii*
C. Medial head of *m. triceps brachii*
D. Lateral head of *m. triceps brachii*
E. Short head of *m. biceps brachii*

28. A 35-year-old man with a trauma of his left hand was admitted to the traumatology department. Objectively: cut wound of palmar surface of left hand; middle phalanxes of II–V fingers don't bend. What muscles are damaged?
A. Superficial finger flexor

B. Profound finger flexor
C. Lumbrical muscles
D. Palmar interosseous muscles
E. Dorsal interosseous muscles

29. A 38-year-old patient came to a traumatology centre and complained about an injury to his right hand. Objectively: the patient has a cut wound in the region of the thenar eminence on the right hand; distal phalanx of the I finger cannot be flexed. What muscle was injured?
A. Long flexor muscle of thumb
B. Short flexor muscle of thumb
C. Short abductor muscle of thumb
D. Opposer muscle of thumb
E. Abductor muscle of thumb

30. A patient with neuritis of femoral nerve has disturbed flexion of thigh as well as disturbed crus extension in the knee joint. What muscle function is disturbed?
A. Quadriceps muscle of thigh
B. Biceps muscle of thigh
C. Triceps muscle of thigh
D. Semitendinous muscle
E. Semimembranous muscle

31. A 42-year-old male with a lesion of the ulnar nerve is unable to flex the II and V fingers to the midline. Which muscle function is impaired in this case?
A. Palmar interosseous muscle
B. Dorsal interosseous muscle
C. Fidicinales
D. Short palmar muscle
E. Abductor muscle of little finger

32. A patient has difficulties with hand movement. Examination revealed inflammation of common synovial sheath of flexor muscles. It is known from the patient's anamnesis that he got a stab wound of finger a week ago. Which finger was most probably damaged?
A. *Digitus minimus*
B. *Pollex*

C. *Digitus medius*
D. *Index*
E. *Digitus anularis*

33. An injured man has bleeding from branches of the carotid artery. For a temporary arrest of bleeding it is necessary to press the carotid artery to the tubercle of a cervical vertebra. Which vertebra is it?
A. VI
B. V
C. IV
D. III
E. II

34. During cystoscopy mucous membrane of urinary bladder normally makes folds except for a single triangular area with smooth mucosa. This triangle is located in the following part of the urinary bladder:
A. Bladder floor
B. Bladder cervix
C. Bladder apex
D. Bladder body
E. Bladder isthmus

35. As a result of an accident a patient has intense painfullness and edema of the anterior crus surface; dorsal flexion of foot is hindered. Function of which crus muscle is most likely to be disturbed?
A. *M. tibialis anterior*
B. *M. flexor digitorum longus*
C. *M. flexor hallucis longus*
D. *M. peroneus longus*
E. *M. peroneus brevis*

36. A surgeon suspects inflammation of the Meckel's diverticulum in a 10-year-old child. This condition requires a surgical intervention. What part of the intestine must be inspected to find the diverticulum?
A. 1 meter of the ileum, starting from the place of its confluence with the large intestine
B. 20 cm of the ileum, starting from the ileocecal angle
C. Descending colon

D. Ascending colon
E. 0.5 meters of jejunum, starting from the ligament of Treitz

37. A patient who suffers from cancer of the back of the tongue has an intense bleeding as a result of affection of the dorsal lingual artery by the tumour. What vessel should be ligated to stop bleeding?
A. Lingual artery
B. Dorsal lingual artery
C. Deep lingual artery
D. Facial artery
E. Ascending pharyngeal artery

38. A 58-year-old patient with acute cardiac insufficiency has decreased volume of daily urine — oliguria. What is the mechanism of this phenomenon?
A. Decreased glomerular filtration
B. Decreased number of functioning glomeruli
C. Drop of oncotic blood pressure
D. Rise of hydrostatic blood pressure in capillaries
E. Reduced permeability of renal filter

39. An 18-year-old man was delivered to the hospital after a road accident. Examination at the traumatological department revealed multiple injuries of soft tissues of the face in the region of the medial eye angle. The injuries caused massive haemorrhage. What arterial anastomosis might have been damaged in this region?
A. *A. carotis externa* and *a. carotis interna*
B. *A. carotis externa* and *a. subclavia*
C. *A. carotis interna* and *a. subclavia*
D. *A. subclavia* and *a. ophthalmica*
E. *A. carotis interna* and *a. ophthalmica*

40. After a 2-year-old child has had flu, there appeared complaints about ear ache. A doctor revealed hearing impairment and inflammation of the middle ear. How did the infection penetrate into the middle ear?
A. Through the auditory tube
B. Through foramen jugulare
C. Through canalis caroticus
D. Through atrium mastoideum
E. Through canalis nasolacrimalis

**Exercise 3. Translate the given word-combinations into Ukrainian.**

Right-sided fracture, the following artery, excessive development, pharyngeal mucous membrane, pterygopalatine fossa, spinal cord puncture, tympanic cavity, gangrenous lesion, descending colon, affected region, femoral nerve, lumbar vertebrae, omental bursa, tibial artery, mammillary process sockets, synovial sheath, knee-jerk reflex, lingual artery, pudendal artery, gluteal nerve, coronary sulcus.

**Exercise 4. Find synonyms to the given words in the tests.**

Shoulder, obstruction, joint, failure, sample, liquid, membrane, retardation, clot, hemorrhage, foramen, influenza, swelling, intestines, sternum.

**Exercise 5. Form adjectives from the nouns. *e. g. lip — labial***

| | | |
|---|---|---|
| mind — | buttock — | heart — |
| tongue — | thigh — | stomach — |
| liver — | palm — | vessel — |
| shoulder — | neck — | kidney — |
| loins — | spine — | brain — |
| nose — | skin — | skull — |
| groin — | lung — | back of the head — |

**Exercise 6. Memorize the formation of plural forms of medical terms.**

| Singular endings | Plural endings | Examples | |
|---|---|---|---|
| | | singular | plural |
| a | ae | vertebr***a*** | vertebr***ae*** |
| en | ina | lum***en*** | lum***ina*** |
| um | a | sept***um*** | sept***a*** |
| us | i | fung***us*** | fung***i*** |
| ex, ix | ices | ind***ex*** | ind***ices*** |

**In Column A of this table there are nouns relating to medicine. For each of the nouns decide whether the correct plural form is in Column B or Column C and then circle it.**

*The first question has been done for you as an example.*

| Column A (singular) | Column B (plural) | Column C (plural) |
|---|---|---|
| bacterium | bacteria | bacteriums |
| nucleus | nucleua | nuclei |
| alveolus | alveoli | alveolei |
| trachea | trachei | tracheae |
| bronchus | bronchi | broncheae |
| humerus | humeruses | humeri |
| fungus | fungi | funguses |
| diagnosis | diagnosises | diagnoses |
| atrium | atriums | atria |
| vertebra | vertebrae | vertebras |
| focus | focuses | focci |
| bacillus | bacilli | bacilluses |
| maxilla | maxillas | maxillae |
| ramus | ramia | rami |
| coccyx | coccyges | coccae |
| thorax | thoraxes | thoraces |
| gingiva | gingivae | gingivas |
| septum | septae | septa |
| apex | apecis | apices |
| coccus | cocci | coccae |
| foramen | foramina | forameni |
| streptococcus | streptococci | streptococcae |
| stratum | strata | stratae |
| medium | mediums | media |
| caecum | caeca | caecci |
| peritoneum | peritoni | peritonea |
| scapula | scapulae | scapuli |

**Exercise 7. Match the medical conditions with their definitions:**

| | |
|---|---|
| 1. A specific form of penetrating trauma to the skin that results from a knife or a similar pointed object. It usually causes a small opening at the skin, but may go very deep. As a result, nerves, tendons, blood vessels, and organs can be injured. | a. mechanic jaundice |
| 2. Feeling as if a lot of small sharp points are being stuck into your skin. | b. blunt injury |
| 3. Yellowness of skin, sclerae, mucous membranes, and excretions due to hyperbilirubinemia and deposition of bile pigments. | c. pheochromocytoma |
| 4. A condition in which a fertilized egg grows outside of the uterus, usually in one of the fallopian tubes. | d. stab wound |
| 5. Injury resulting from impact with a blunt object, i. e., one that does not possess any sharp edges. | e. oliguria |
| 6. A type of broken bone, in which the bone is broken into more than two pieces. | f. comminuted fracture |
| 7. A rare tumor of the adrenal medulla composed of chromaffin cells, also known as pheochromocytes. | g. extrauterine pregnancy |
| 8. A low output of urine specifically more than 80 ml/day but less than 400ml/day. | h. skin prickle |

**Exercise 8. Make 15 two-word expressions connected with medicine by combining words from the two lists: A and B. Match each expression with the appropriate phrase. Use each word once. The first one has been done for you as an example.**

| A | B |
|---|---|
| allergic | anaesthetic |
| balanced | **attack** |
| bedside | clock |
| biological | diet |
| bone | death |
| brain | tumour |
| clinical | trial |
| surgical | reaction |

| | |
|---|---|
| primary | surgery |
| plastic | intervention |
| malignant | practitioner |
| **heart** | marrow |
| general | system |
| general | manner |
| digestive | tooth |

1. A condition in which the heart has a reduced blood supply because one of the arteries becomes blocked by a blood clot, causing myocardial ischaemia and myocardial infarction. — **heart attack**

2. A substance given to make someone lose consciousness so that a major surgical operation can be carried out. — _____

3. Soft tissue in cancellous bone. — _____

4. The treatment of disease or other condition by surgery. — _____

5. Any one of the first twenty teeth which develop in children between about six months and two-and-a-half years of age, and are replaced by the permanent teeth at around the age of six. — _____

6. Surgery to repair damaged or malformed parts of the body. — _____

7. A condition in which the nerves in the brain stem have died, and the person can be certified as dead, although the heart may not have stopped beating. — _____

8. The way in which a doctor behaves towards a patient, especially a patient who is in bed. — _____

9. An effect produced by a substance to which a person has an allergy, such as sneezing or a skin rash.

10. A trial carried out in a medical laboratory on a person or on tissue from a person. — _____

11. A tumour which is cancerous and can grow again or spread into other parts of the body, even if removed surgically. — _____

12. A doctor who provides first-line medical care for all types of illness to people who live locally, refers them to hospital if necessary and encourages health promotion. — _____

13. The rhythm of daily activities and bodily processes such as eating, defecating or sleeping, frequently controlled by hormones, which repeats every twenty-four hours. — _____

14. The set of organs such as the stomach, liver and pancreas which are associated with the digestion of food. — _____

15. A diet that provides all the nutrients needed in the correct proportions. — _____

**Exercise 9. Learn the Greek-Latin term elements used in medicine**

| | | |
|---|---|---|
| 1. -(a)emia — blood | 28. fibr/o — fiber | 55. oss/i — bone |
| 2. angi/o — vessel | 29. gastro — stomach | 56. oste(o) — bone |
| 3. antr/o — sinus, cavity | 30. gloss — tongue | 57. pathy — disease |
| 4. -(a)esthesia — sensation | 31. genesis — origin | 58. phonia — voice |
| 5. -algia — pain | 32. haem/o — blood | 59. plasty — plastic repair |
| 6. aort/o — aorta | 33. hepat(o) — liver | 60. pleuro — pleura |
| 7. bronch(o) — bronchus | 34. hyster(o) — uterus | 61. penia — deficiency |
| 8. cardi/o — heart | 35. lapar(o) — abdomen | 62. plegia-paralysis |
| 9. celi/o — abdominal cavity | 36. laryng(o) — larynx | 63. phleb/o — vein |
| 10. cephal — head | 37. leuk(o) — white blood cell | 64. pneumo — lung |
| 11. cheil(o) — lip | 38. logy— study of | 65. procto — anus or rectum |
| 12. chir/o — hand | 39. lysis— dissolving | 66. pyelo — renal pelvis |
| 13. cholangio — bile ducts | 40. mamma— brest | 67. rhin(o) — nose |
| 14. cholecysto — gallbladder | 41. metro— uterus | 68. -rhagia — profuse flow |
| 15. choledocho — a common bile duct | 42. my/o — muscle | 69. salpingo — the Fallopian tubes or the Eustachian tube |
| 16. colpo — vagina | 43. myel/o — spinal cord | 70. sclerosis — hardening |
| 17. cortic(o) — cortex | 44. nas(o) — nose | 71. splanchno — internal organs |
| 18. cost/o — rib | 45. nephr(o) — kidney | 72. spleno — spleen |
| 19. crani/o — skull | 46. neur/o— nerve | 73. stasis — stoppage |
| 20. cyst — bladder | 47. ne(o) — new | 74. stenosis — narrowing |
| 21. cyte — cell | 48. ocul(o) — eye | 75. stern/o — sternum |
| 22. dent/i — tooth | 49. odont(o) — tooth | 76. stomat/o — mouth |
| 23. dermat/o — skin | 50. omphalo — navel | 77. tachy — rapid |
| 24. emia — blood | 51. oo — ovum | 78. thorac/o — chest |
| 25. encephal(o) — brain | 52. oophoro — ovary | 79. tracheo — trachea |
| 26. ectomy — surgical removal | 53. ophthalm/o — eye | |
| 27. enter/o — intestine | 54. orchi/o — testicle | |

| | | |
|---|---|---|
| 80. trachelo — cervix of uterus<br>81. thrombo — blood clot<br>82. tomy — incision | 83. typhlo — caecum<br>84. thyre(o) — thyroid<br>85. -uria — urine | 86. utero — uterus<br>87. vas/o — vessel<br>88. viro — virus |

**Exercise 10. Create terms using the term element "myo". Find their meanings below:**

Albumin, blast, cerosis, diastasis, edema, atrophy, plasty, cyte.

| |
|---|
| 1. A condition of necrotic damage, specific to muscle tissue |
| 2. Early muscle cells with a single nucleus |
| 3. Edema of a muscle |
| 4. Muscle albumin |
| 5. Division or rupture of a muscle |
| 6. Type of cell found in some types of muscle tissue |
| 7. Wasting of muscles, caused by disease of the nerves supplying them |
| 8. The plastic surgery of muscle, in which part of a muscle is partly detached and used to repair tissue defects or deformities in the vicinity of the muscle |

**Exercise 11. Analyze the terms related to blood and give explanation of each.**

Hemanalysis, hemangioma, hematoid, hemopoiesis, hematology, hematotherapy.

**Exercise 12. Match the terms below with their definitions:**

| |
|---|
| Angiostenosis, angioneurectomy, phlebograph, angioplasty, angionecrosis, cardialgia, cardioangiology, cardiodynamics, cardiometer, phlebitis, vasoactive, vasoconstriction, vasodilatation, phlebotomy, vasomotion |

1. Pain in the heart.
2. Inflammation of the veins.
3. Repair or reconstruction of a narrowed or completely obstructed blood vessel.
4. A decrease in diameter of blood vessels.
5. The scientific study about movements and forces concerning the heart activity.
6. Ossification or calcification of blood vessels.

7. An instrument for measuring the heart size.
8. An apparatus for venous pulse inscription.
9. Necrosis of the walls of blood vessels.
10. An increase in the diameter of blood vessels.
11. An increase or decrease in the diameter of blood vessels.
12. The scientific study about heart and blood vessels.
13. Removal of vessels and nerves.
14. Surgical incision into a vein.
15. Affecting the diameter of blood vessels.

**Exercise 13. Match the terms below with their definitions:**

| |
|---|
| Encephalitis, encephaloscopy, encephaloma, enchephalagia, cerebrology, cerebroid, cerebropathy, cerebrotomy, hydrocephalus, polioencephalitis, poliomyelopathy, poliovirus, poliodystrophy, myelitis, myelosis |

1. Study of the structure and functions of the brain.
2. Any disease of the brain.
3. Virus being the etiological factor of poliomyelitis.
4. Incision of part of the brain.
5. Inflammation of the brain.
6. Inflammation of the grey substance of the brain.
7. Any swelling or tumour of the brain.
8. Examination of the brain.
9. Inflammation of the spinal cord.
10. Atrophy of the brain grey substance.
11. Headache.
12. Any disease affecting the grey substance of the spinal cord.
13. Abnormal accumulation of fluid in the brain.
14. Neoplasm of the spinal cord.
15. Resembling the brain, brain-like.

# Chapter II

**Exercise 1. Key words.**

| Noun | Verb | Adjective | Adverb |
|---|---|---|---|
| alteration | admit | adrenal | behind |
| cluster | affect | aggregated | in the course of |
| consequence | apply | axillary | inside |
| conclusion | complain | cervical | inwards |
| curvature | constrict | cutaneous | on account of |
| gyrus | excise | inguinal | prior |
| hernia | execute | interlobular | |
| induration | involve | masticatory | |
| infant | leak | parietal | |
| intervention | ligate | parotid | |
| obturation | protrude | penetrating | |
| process | require | preterm | |
| pudendum | | | |
| resuscitation | | | |
| strabismus | | | |
| wound | | | |

**Exercise 2. Read the tests.**

1. A patient got a craniocerebral trauma that resulted in right-side convergent strabismus. Which craniocerebral nerve damage caused such consequences?

A. *N. abducens*
B. *N. facialis*
C. *N. trigeminus*
D. *N. trochlearis*
E. *N. oculomotorius*

2. In case of a penetrating wound of the anterior abdominal wall the wound tract went above the lesser curvature of stomach. What peritoneum formation is most likely to be injured?

A. *Ligamentum hepatogastricum*
B. *Ligamentum gastrocolicum*
C. *Ligamentum hepatoduodenale*

D. *Ligamentum hepatorenale*
E. *Ligamentum triangulare sinistrum*

3. After a trauma a patient lost ability of elbow extension. This might have been caused by the dysfunction of the following main muscle:
A. *M. triceps brachii*
B. *M. subscapularis*
C. *M. teres major*
D. *M. infraspinatus*
E. *M. levator scapulae*

4. While playing a child got a punch in the presternum region. As a result of this trauma an organ located behind the presternum was damaged. Name this organ:
A. Thymus
B. Thyroid gland
C. Heart
D. Pericardium
E. Larynx

5. A patient complains of acute pain attacks in the right lumbar region. During examination the nephrolithic obturation of the right ureter in the region between its abdominal and pelvic segments has been detected. What anatomical boundary exists between those two segments?
A. *Linea terminalis*
B. *Linea semilunaris*
C. *Linea arcuata*
D. *Linea transversa*
E. *Linea inguinalis*

6. After a craniocerebral trauma a patient lost the ability to execute learned purposeful movements (apraxia). The injury is most likely localized in the following region of the cerebral cortex:
A. *Gyrus supramarginalis*
B. *Gyrus angularis*
C. *Gyrus paracentralis*
D. *Gyrus lingualis*
E. *Gyrus parahippocampalis*

7. A patient got an injury of the spinal marrow in a road accident that caused loss of tactile sensation, posture sense, vibration sense. What conduction tracts are damaged?

A. Fascicle of Goll and cuneate fascicle
B. Anterior spinocerebellar tract
C. Rubrospinal tract
D. Reticulospinal tract
E. Tectospinal tract

8. Examination of a patient revealed hypertrophy and inflammation of lymphoid tissue, edema of mucous membrane between palatine arches (acute tonsillitis). What tonsil is normally situated in this area?

A. *Tonsilla palatina*
B. *Tonsilla pharyngealis*
C. *Tonsilla tubaria*
D. *Tonsilla lingualis*
E. —

9. While performing an operation in the area of axillary crease a surgeon has to define an arterial vessel surrounded by fascicles of brachial plexus. What artery is it?

A. *A. axillaris*
B. *A. vertebralis*
C. *A. transversa colli*
D. *A. profunda brachii*
E. *A. subscapularis*

10. Examination of a patient with impaired blood coagulation revealed thrombosis of a branch of inferior mesenteric artery. What bowel segment is damaged?

A. Sigmoid colon
B. Ileum
C. Caecum
D. Transverse colon
E. Ascending colon

11. A patient was admitted to the surgical department with inguinal hernia. During the operation the surgeon performs plastic surgery on the posterior wall of the inguinal canal. What structure forms this wall?

A. Transverse fascia
B. Aponeurosis of abdominal external oblique muscle
C. Inguinal ligament
D. Loose inferior edge of transverse abdominal muscle
E. Peritoneum

12. In order to prevent massive haemorrhage in the region of the oral cavity floor it is required to ligate an artery which is located within Pirogov's triangle. What artery is it?
A. Lingual artery
B. Superior thyroid artery
C. Facial artery
D. Ascending pharyngeal artery
E. Maxillary artery

13. A man with an injury to the dorsal area of his neck was admitted to the resuscitation department. What muscle occupies this area?
A. *M. trapezius*
B. *M. sternocleidomastoideus*
C. *M. latissimus dorsi*
D. *M. rhomboideus minor*
E. *M. scalenus anterior*

14. A 70 y. o. man has cut an abscess off in the area of mammiform process during shaving. Two days later he was admitted to the hospital with inflammation of arachnoid membranes. How did the infection penetrate into the cavity of the skull?
A. *V. v. emissariae mastoideae*
B. *V. v. labyrinthi*
C. *V. v. tympanicae*
D. *V. facialis*
E. *V. v. auriculares*

15. While palpating the mammary gland of a patient a doctor revealed an induration in the form of a node in the inferior medial quadrant. Metastases may extend to the following lymph nodes:
A. Parasternal
B. Posterior mediastinal
C. Profound lateral cervical

D. Bronchopulmonary
E. Superior diaphragmal

16. A patient got a trauma that caused dysfunction of motor centres regulating activity of head muscles. In what parts of the cerebral cortex is the respective centre normally localized?
A. Inferior part of precentral gyrus
B. Superior part of precentral gyrus
C. Supramarginal gyrus
D. Superior parietal lobule
E. Angular gyrus

17. During an invasive operation the surgeon needs to access the omental bursa of the peritoneal cavity via the omental foramen (foramen of Winslow). What anatomical structure makes up the anterior border of this foramen?
A. Hepatoduodenal ligament
B. Hepatorenal ligament
C. Visceral surface of liver
D. Superior part of duodenum
E. Greater omentum

18. A patient has lost skin sensitivity in the region of the medial surface of his shoulder. This is the result of dysfunction of the following nerve:
A. Medial brachial cutaneous nerve
B. Medial antebrachial cutaneous nerve
C. Radial nerve
D. Ulnar nerve
E. Axillary nerve

19. After a baby is born, the vascular system of the newborn undergoes changes associated with the transition from the placental circulation to the pulmonary circulation. What blood vessel transforms into the round ligament of the liver as a result of this process?
A. *V. umbilicalis*
B. *Umbilicalis dextra*
C. *Ductus arteriosus*
D. *Umbilicalis sinistra*
E. *Ductus venosus*

20. A patient was diagnosed with bartholinitis (inflammation of greater vulvovaginal glands). In which organ of the urogenital system are these glands localized?

A. Large lips of pudendum
B. Small lips of pudendum
C. Clitoris
D. Vagina
E. Uterus

21. A patient is diagnosed with compression fracture of the lumbar vertebra. The patient presents with acutely increased lumbar lordosis. What ligament was damaged in this patient resulting in such deformation of vertebral column curvature?

A. Anterior longitudinal ligament
B. Posterior longitudinal ligament
C. Yellow ligament
D. Iliolumbar ligament
E. Interspinal ligament

22. Ultrasonic examination of a patient revealed aneurism in the area of aortic arch that caused alteration of vocal function of larynx. What nerve was constricted?

A. Recurrent laryngeal
B. Diaphragmatic
C. Superior laryngeal
D. Mandibular
E. Sublingual

23. Surgical approach to the thyroid gland from the transverse (collar) approach involves opening of interaponeurotic suprasternal space. What anatomic structure localized in this space is dangerous to be damaged?

A. Jugular venous arch
B. External jugular vein
C. Subclavicular vein
D. Inferior thyroid artery
E. Superior thyroid artery

24. In the course of a small pelvis operation it became necessary to ligate an ovarian artery. What formation may be accidentally ligated together with it?

A. Ureter
B. Uterine tube
C. Round ligament of uterus
D. Internal iliac vein
E. Urethra

25. An injured person was delivered to the hospital with a penetrating wound in the left lateral region of abdomen. What part of the large intestine is most likely damaged?

A. Descending colon
B. Ascending colon
C. Transverse colon
D. Caecum
E. Rectum

26. After a road accident a driver was delivered to the hospital with an injury of the medial epicondyle of humerus. What nerve might be damaged in this case?

A. *N. ulnaris*
B. *N. radialis*
C. *N. axillaris*
D. *N. muscolocutaneus*
E. *N. medianus*

27. A patient with a knife wound in the left lumbar part was delivered to the emergency hospital. In the course of operation, a surgeon found that internal organs were not damaged but the knife injured one of the muscles of the renal pelvis. What muscle is it?

A. Greater psoas muscle
B. Iliac muscle
C. Erector muscle of spine
D. Abdominal internal oblique muscle
E. Abdominal external oblique muscle

28. A 25-year-old patient was examined by a medical board. Examination revealed pathology of the chest. Transverse dimensions were

too small and the sternum was strongly protruding. What chest type is it?

A. Keeled chest
B. Funnel chest
C. Flat chest
D. Cylindrical chest
E. Barrel chest

29. A man with a stab wound in the area of quadrilateral foramen applied to a doctor. Examination revealed that the patient was unable to draw his arm aside from his body. What nerve is most probably damaged?

A. *N. axillaris*
B. *N. medianus*
C. *N. radialis*
D. *N. ulnaris*
E. *N. subclavius*

30. A female patient has facial neuritis that has caused mimetic paralysis and hearing impairment. Hearing impairment results from the paralysis of the following muscle:

A. Stapedius muscle
B. Anterior auricular muscle
C. Superior auricular muscle
D. Posterior auricular muscle
E. Nasal muscle

31. Electrical activity of neurons is being measured. They fire prior to and at the beginning of inhalation. Where are these neurons situated?

A. Medulla oblongata
B. Diencephalon
C. Mesencephalon
D. Spinal cord
E. Cerebral cortex

32. A surgeon has to find the common hepatic duct during operative intervention for treatment of concrements in the gall ducts. The common hepatic duct is located between the leaves of:

A. Hepatoduodenal ligament
B. Hepato-gastric ligament

C. Hepato-renal ligament
D. Round ligament of liver
E. Venous ligament

33. Preventive examination of a patient revealed an enlarged lymph node of metastatic origin on the medial wall of the left axillary crease. Specify the most likely localization of the primary tumour:
A. Mammary gland
B. Submandibular salivary gland
C. Lung
D. Stomach
E. Thyroid gland

34. A patient complains of pain in the upper umbilical region. On palpation there is a mobile painful intestine. What intestine is being palpated by the doctor?
A. Transverse colon
B. Jejunum
C. Duodenum
D. Ileum
E. Sigmoid colon

35. An unidentified surgical specimen is received for histopathologic analysis. A portion of the specimen is cut and stained with hematoxylin and eosin. Under the microscope, you see an organ encapsulated by dense connective tissue that extends to the deeper areas by way of the trabecular extensions. The organ can be subdivided into two regions: a cortex with lymphoid nodules and medulla with medullary cords populated by plasma cells, B-cells and T-cells. Which of the following structures is most likely the origin of this surgical specimen?
A. Lymph node
B. Thymus
C. Spleen
D. Bone marrow
E. Tonsils

36. A 24-year-old man undergoes surgery and during the operation, an organ is excised and sent for histological evaluation. A light microscopic examination reveals the organ encased by thin connective tissue capsule

that enters the substance of the lobes to further subdivide the organ into irregular lobular units. Each lobule contains a cluster of follicles filled with colloid. Follicular epithelium consists of low columnar, cuboidal or squamous cells depending on the level of activity of the follicle. Which of the following organs does this tissue most likely belong to?

A. Thyroid gland
B. Pancreas
C. Parotid gland
D. Thymus
E. Parathyroid gland

37. A patient with periodontitis of the lower molar came to the doctor. It was determined that the inflammatory process spread to the lymph nodes. What lymph nodes were the first to be affected by the inflammatory process?

A. Submandibular
B. Lateral cervical
C. Anterior cervical
D. Submental
E. Facial

38. The surgeon noticed aggregated lymphoid nodules (Peyer's patches) on the intestinal mucosa. What portion of the intestine is it?

A. Ileum
B. Jejunum
C. Cecum
D. Duodenum
E. Rectum

39. An oncology patient is to undergo a surgery on the descending colon. Name the main source of blood supply to this organ:

A. Inferior mesenteric artery
B. Superior mesenteric artery
C. Celiac trunk
D. Middle colic artery
E. Splenic artery

40. A victim has received a deep incised stab wound to the upper posterior surface of the shoulder. Extension of elbow, hand, and digits is im-

paired; skin sensitivity of the posterior surface of the shoulder and forearm is lost. What nerve is damaged in this case?

A. *N. radialis*
B. *N. ulnaris*
C. *N. cutaneus brachii medialis*
D. *N. medianus*
E. *N. musculocutaneus*

**Exercise 3. Translate the word-combinations into Ukrainian.**

A medical board, tetanic convulsions, umbilical region, lacrimation disorder, femoral hernia, greater omentum, axillary crease, humeral articulation, preterm infant, medulla oblongata, operative intervention, inguinal canal operation, resuscitation department, surgical intervention, nephrolitic obturation, on account of hernia, to reveal an induration, alteration of vocal function of larynx, craniocerebral injury, omental foramen.

**Exercise 4. Insert the words from the box into the gaps.**

| Alveoli, afferent, fossa ovalis, hepatopancreatic sphincter, endocardium, pulmonary artery, pulmonary vein, esophagus, a bolus, ventricle |
|---|

1. The main chamber of the heart pumping blood — **ventricle**
2. The _____ carries deoxygenated blood from the right ventricle to the lungs.
3. The _____ is situated at the lower part of the septum, above and to the left of the orifice of the inferior vena cava.
4. The _____ is a thin, smooth membrane which lines and gives the glistening appearance to the inner surface of the heart.
5. The _____ are lined by a delicate layer of simple squamous epithelium, the cells of which are united at their edges by cement substance.
6. The _____ commences in the pulmonary capillaries, the radicles coalescing into larger branches which run through the substance of the lung, independently of the pulmonary arteries and bronchi.
7. The food is chewed and mixed with the saliva to form _____, which is moved to the pharynx by the tongue.
8. Between swallows the _____ is collapsed but the lumen can distend to approximately 2 cm in the anterior-posterior dimension and up to 3 cm laterally to accommodate a swallowed bolus.

9. The_____regulates the flow of both bile and pancreatic juice from the ampulla into the duodenum.

10. _____neurons transmit sensory signals to the central nervous system from receptors in the body.

**Exercise 5. Find synonyms to the given words in the tests.**

Hyperemia, limb, examination, groove, giddiness, deafness, disorder, tearing, to injure, to reduce, occlusion, lumen.

**Exercise 6. Word-building. Form the derivatives of the given words.**

| verb | noun | adjective |
|---|---|---|
| to injure | | |
| | involvement | |
| | | developed/developing |
| to divide | | |
| | | invasive |
| | impairment | |
| | | inflammatory |
| to aggregate | | |
| | disturbance | |
| to deliver | | |

**Exercise 7. Substitute words given in *italics* with the words from the box:**

| |
|---|
| Angina pectoris, epiploon, pituitary gland, foramen, gingiva, lower hollow vein, vagus nerve, swallowing, groove, collarbone |

1. There are clean incisions in the third costal cartilage as well as the *clavicle*.

2. The valve of the *inferior vena cava* is situated in front of the orifice of the inferior vena cava.

3. At an attack of a *stenocardia* the expressed painful syndrome is observed.

4. The intimate branches departing from *a wandering nerve* is responsible for the realization of pain in the heart.

5. The *opening* of the pulmonary artery is circular in form, and situated at the summit of the conus arteriosus, close to the ventricular septum. It is guarded by the pulmonary semilunar valves.

6. *A sulcus* produced by the subclavian artery as it curves in front of the pleura runs upward and lateral ward immediately below the apex.

7. The crown of the tooth extends above the *gum* and is covered by enamel.

8. After the bolus is moved into the pharynx, it is ready for the involuntary phase of *deglutition*.

9. The *greater omentum* is a large apron-like fold of visceral peritoneum that hangs down from the stomach.

10. *Hypophysis* coordinates hormone levels and the work of the other glands. It can bring about a change in hormone production somewhere in the system by releasing its own stimulating hormones.

**Exercise 8. Match the terms with their definitions:**

| | |
|---|---|
| 1. The auricular | a) are derived from the thoracic aorta or from the upper aortic intercostal arteries, and, accompanying the bronchial tubes, are distributed to the bronchial glands and upon the walls of the larger bronchial tubes and pulmonary vessels |
| 2. Angina pectoris | b) is the groove that extends downward from the nose over the midline of the lip, and in its extension of the upper lip possesses a berry-shaped prominence, which fits into a groove in the lower lip |
| 3. The inferior vena cava | c) is a tube, about 12 cm long, at the base of the skull, which merges into the esophagus at the level of the cricoid cartilage |
| 4. The apex of the lung | d) often occurs when the heart muscle itself needs more blood than it is getting, for example, during times of physical activity or strong emotions |
| 5. The bronchial arteries | e) is a part of the peritoneum attached to the stomach and liver and supporting the hepatic vessels |
| 6. The philtrum | f) is its most superior point where both costal and medi-astinal surfaces merge |

| | |
|---|---|
| 7. The pharynx | g) is formed by the joining of the left and right common iliac veins and brings collected blood into the right atrium of the heart. |
| 8. Meninges | h) is the principal determinant of the color of blood in vertebrates which carries oxygen from the lungs |
| 9. Lesser omentum | i) is a small conical muscular sac, the margins of which present a dentated edge. It projects from the upper and front part of the sinus forward and toward the left side, overlapping the root of the aorta |
| 10. Hemoglobin | j) is the system of membranes which envelop and protect the central nervous system |

**Exercise 9. Give explanation to the following terms:**

Thyrocele, thyrolytic, thyroidin, lymphangioma, lymphblast, tracheostomy, pharyngomycosis, pneumobilia, pneumoectomy, neurasthenia, neurolemmoma, neuralgia.

**Exercise 10.**

**A. Memorize the meaning of the following term-elements:**

**Chole —** combining form of Greek origin denoting **bile**

**Hepato —** combining form of Greek origin denoting **liver**

**B. Read the definitions and match them to the following terms:**

*Hepatology, hepatitis, hepatoblastoma, hepatoma, hepatologist, hepatopathy, hepatomegaly, hepatogenous, cholecystitis, cholecyst, cholecystectomy, cholecystopathy, cholecystotomy, cholecystography*

1. A malignant tumour of the liver in newborns or children.
2. A specialist in liver.
3. Any disease of the liver.
4. The scientific study about liver diseases.
5. Gallbladder.
6. A malignant tumour of the liver.
7. Inflammation of the gallbladder.
8. The surgical cutting (incision) of the gallbladder.
9. Surgical removal of the gallbladder.
10. Any disease of the gallbladder.
11. Originating in the liver.

12. An abnormal enlargement of the liver caused by congestion, inflammation, or a tumor.

13. Inflammation of the gallbladder characterized by fever, jaundice and weakness.

14. Radiography of the gallbladder after administration of a contrast medium.

**Exercise 11.**

**A. Memorize the meaning of the following term-elements:**
**Ophthalm/o —** combining form of Greek origin denoting **eye**
**Ocul/o —** combining form of Latin origin denoting **eye**
**Kerat/o —** combining form of Greek origin denoting **horn**
**Irid/o —** combining form of Greek origin denoting **iris**

**B. Read the definitions and match them to the following terms:**

*Ophthalmoplasty, ophthalmotoxin, ophthalmologist, ophthalmoplegia, iridoplegia, iridemia, iridectomy, keratitis, keratohemia, keratoconjunctivitis, occulofacial, occulopathy*

1. Pertaining to eyes and face.
2. A toxin affecting eyes.
3. Bleeding from the iris.
4. Plastic surgery of eyes.
5. Inflammation of the retina
6. Paralysis of the iris sphincter
7. Any disease of the eye
8. Paralysis of the eye muscle
9. Inflammation of the retina and conjunctiva
10. A doctor trained to treat eye diseases
11. Blood in the retina
12. Excision of the iris thickened part

**Exercise 12. What do the following medical abbreviations mean?** AB, ACTH, ANS, AR, ATS, C. I., DOA, D & V, ICP, M. P. D., NAD, NP, NSA, PPH, RNA, RTI, SAH, SB, s. c., WNL.

# *UNIT 2*
# BIOLOGY

**Exercise 1. Key words.**

| Noun | Verb | Adjective | Adverb |
|---|---|---|---|
| apoptosis | define | developmental | approximately |
| carrier | deliver | drastic | congenitally |
| chain | determine | environmental | immediately |
| dysmenorrhea | introduce | germinal | predominantly |
| incompatibility | label | haploid | respectively |
| infertility | observe | multiple | |
| maturation | occur | necessary | |
| offspring | release | provisional | |
| ovum | resist | similar | |
| pattern | restore | subnormal | |
| scrape | result in | yellowish | |
| sequence | spread | | |

**Exercise 2. Read the tests.**

1. A young man has come to the genetic consultation. He complains of abnormalities in his physical and reproductive development. Microscopy of his oral mucosa cells shows one Barr body. What karyotype is the most likely in this young man?

A. 47, XXY
B. 45, X0
C. 47, XY, +21
D. 47, XY, +18
E. 47, XYY

2. The mother's karyotype has 45 chromosomes. It was determined that translocation of chromosome 21 to chromosome 14 had occurred.

What disorder is likely to be observed in the child of this woman if the father's karyotype is normal?

A. Down syndrome
B. Klinefelter syndrome
C. Patau syndrome
D. Edwards syndrome
E. Morris syndrome (androgen insensitivity)

3. The initiation of the transcription process becomes possible when an enzyme DNA-dependent RNA polymerase attaches to a certain segment of DNA molecule. Name this DNA segment:

A. Promoter
B. Terminator
C. Regulator
D. Repressor
E. Suppressor

4. A mutation has occurred in a cell in the first exon of its structural gene. The number of nucleotide pairs changed from 290 to 250. Name the type of mutation:

A. Deletion
B. Inversion
C. Duplication
D. Translocation
E. Nullisomy

5. Cells of a person working in the Chornobyl Exclusion Zone have undergone a mutation in a DNA molecule. However, with time the damaged interval of a DNA molecule restored its initial structure with a specific enzyme. In this case the following occurred:

A. Repair
B. Replication
C. Transcription
D. Reverse transcription
E. Translation

6. A man is a carrier of HIV that is an RNA virus. The cells of this patient synthesize viral DNA. This process is based on:

A. Reverse transcription
B. Replication
C. Transcription
D. Repair
E. Translation

7. The parents with normal hearing have two daughters and a son, who are congenitally deaf. Their other 5 children are healthy. What is the pattern of deafness inheritance in this case?
A. Autosomal recessive
B. Autosomal dominant
C. X-linked recessive
D. X-linked dominant
E. Y-linked

8. Ingestion of plants and mushrooms that grow along highways is dangerous due to risk of lead poisoning. What is the main source of environmental pollution with this chemical element?
A. Exhaust fumes
B. Sewage
C. Acid rains
D. Herbicides
E. Chemical fertilizers

9. At the stage of translation in the rough endoplasmic reticulum, the ribosome moves along the mRNA. Amino acids are joined together by peptide bonds in a specific sequence, and thus polypeptide synthesis takes place. The sequence of amino acids in a polypeptide corresponds to the sequence of:
A. mRNA codons
B. tRNA nucleotides
C. tRNA anticodons
D. rRNA nucleotides
E. rRNA anticodons

10. The organisms to be identified have a nucleus surrounded by a nuclear membrane. Genetic material is concentrated predominantly in the chromosomes that consist of DNA strands and protein molecules. These cells divide mitotically. Identify these organisms:

A. Eukaryotes
B. Bacteriophages
C. Prokaryotes
D. Viruses
E. Bacteria

11. An infant has been diagnosed with microcephaly. Doctors suspect that this brain disorder has developed due to the fact that the mother has been taking actinomycin D during her pregnancy. What germinal layers have been affected by this teratogen?
A. Ectoderm
B. Entoderm
C. Mesoderm
D. Entoderm and mesoderm
E. All germinal layers

12. A team of medical students is performing research on phases of cell cycle. During one of the mitotic phases the cell has almost divided, the chromosomes are decondensed and two nuclei have begun to form around them. Which of the following phases most likely takes place in the cell?
A. Telophase
B. Prophase
C. Metaphase
D. Anaphase
E. Another variant

13. As a result of prophylactic medical examination a 7-year-old boy was diagnosed with Lesch-Nyhan syndrome (only boys fall ill with it). The boy's parents are healthy but his grandfather by his mother's side suffers from the same disease. What type of disease inheritance is it?
A. Recessive, sex-linked
B. Dominant, sex-linked
C. Autosomal recessive
D. Autosomal dominant
E. Semidominance

14. Representatives of a certain human population can be characterized by elongated body, height variability, decreased volume of muscle mass, increased length of limbs, decreased size and volume of ribcage, in-

creased perspiration, decreased indices of base metabolism and fat synthesis. What type of adaptive evolution is it?

A. Tropical
B. Arctic
C. Moderate
D. Intermediate
E. Mountain

15. Hartnup disease is caused by point mutation of only one gene which results in disturbance of tryptophan absorption in the bowels and its resorption in renal tubules. It is the reason for disorder of both digestive and urination systems. What genetic phenomenon is observed in this case?

A. Pleiotropy
B. Complementary interaction
C. Polymery
D. Codominance
E. Semidominance

16. A 28-year-old female patient consulted a gynecologist about sterility. Examination revealed underdeveloped ovaries and uterus, irregular menstrual cycle. Analysis of the sex chromatin revealed 2 Barr's bodies in most somatic cells. What chromosome disease is most likely?

A. Triple X syndrome
B. Edwards' syndrome
C. Patau's syndrome
D. Klinefelter's syndrome
E. Turner's syndrome

17. During an experiment, a Southern blot analysis is done by digesting DNA samples with a single restriction endonuclease, separating the digestion products by gel electrophoresis, and transferring them to a filter. The investigator probes the filter by exposing it to a cDNA clone that encodes a single immunoglobulin-constant region. The figure shows the resulting pattern with DNA samples isolated from different organs. Assuming there were no technical errors, the Southern blot analysis results demonstrate which of the following processes?

A. Gene rearrangement
B. Apoptosis
C. Affinity maturation

D. RNA splicing
E. Somatic hypermutation

18. A woman with the III (B), Rh (-) blood group gave birth to a child with the II (A) blood group. The child is diagnosed with hemolytic disease of the newborn caused by rhesus incompatibility. What blood group and Rh does the father have?
A. II (A), Rh (+)
B. I (0), Rh (+)
C. III (B), Rh (+)
D. I (0), Rh (-)
E. II (A), Rh (-)

19. A couple comes for preconception genetic counselling because they both have a family history of α-thalassemia. The woman has a minimally decreased hemoglobin concentration. Genetic studies show a single gene deletion. The man has microcytic anemia and a two-gene deletion. If the two-gene deletion is in trans (one deletion on the maternal gene and one deletion on the paternal gene), which percentage of their offspring will have a two-gene deletion?
A. 50%
B. 25%
C. 0%
D. 75%
E. 100%

20. Genealogical analysis of a child with myotonic dystrophy determined that this disease is present in every generation, equally for both genders, and the inheritance risk is equal no matter which parent is affected. If one of the parents is heterozygous for this disease and the other one is healthy, the risk of them giving birth to a sick child is 50%. What type of disease inheritance is it?
A. Autosomal dominant
B. Autosomal recessive
C. X-linked dominant
D. X-linked recessive
E. Y-linked

21. Examination of a patient revealed reduced contents of magnesium ions that are necessary for attachment of ribosomes to the granular endoplasmic reticulum. It is known that it causes disturbance of protein biosynthesis. What stage of protein biosynthesis will be disturbed?

A. Translation
B. Transcription
C. Replication
D. Aminoacid activation
E. Termination

22. According to the model of double DNA helix that was suggested by Watson and Creek, it was established that one of chains would not be lost during replication and the second chain would be synthesized complementary to the first one. What way of replication is it?

A. Semiconservative
B. Analogous
C. Identical
D. Dispersed
E. Conservative

23. In the course of practical training students studied a stained blood smear of a mouse with bacteria phagocyted by leukocytes. What cell organelles complete digestion of these bacteria?

A. Lysosomes
B. Mitochondrions
C. Granular endoplasmic reticulum
D. Golgi apparatus
E. Ribosomes

24. Golgi complex exports substances from a cell due to the fusion of the membrane saccule with the cell membrane and saccule contents flow out. What process is it?

A. Exocytosis
B. Endocytosis
C. Active transport
D. Facilitated diffusion
E. All answers are false

25. Streptomycin and other aminoglycosides prevent the joining of formylmethionyl-tRNA by bonding with the 30S ribosomal subunit. This effect leads to disruption of the following process:

A. Translation initiation in prokaryotes
B. Translation initiation in eukaryotes
C. Transcription initiation in prokaryotes
D. Transcription initiation in eukaryotes
E. Replication initiation in prokaryotes

26. Students study the stages of gametogenesis. They analyse a cell with a haploid number of chromosomes, with each chromosome consisting of two chromatids. The chromosomes are located in the equatorial plane of the cell. Such situation is typical of the following stage of meiosis:

A. Metaphase of the second division
B. Metaphase of the first division
C. Anaphase of the first division
D. Anaphase of the second division
E. Prophase of the first division

27. It is known that the gene responsible for development of blood groups according to AB0 system has three allele variants. Existence of the IV blood group can be explained by the following variability form:

A. Combinative
B. Mutational
C. Phenotypic
D. Genocopy
E. Phenocopy

28. A child is diagnosed with hemolytic disease of the newborn (HDN) caused by rhesus incompatibility. What blood group and Rh can the father have?

A. II (A), Rh+
B. I (0), Rh+
C. III (B), Rh+
D. I (0), Rh-
E. II (A), Rh-

29. Examination of new-borns in one of the Ukrainian cities revealed a baby with phenylketonuria. The baby's parents don't suffer from this

disease and have two other healthy children. Specify the most likely parents' genotype with phenylketonuria gene:

A. Aa x Aa
B. AA x aa
C. aa x aa
D. Aa x aa
E. Aa x AA

30. Healthy parents with an unremarkable family history have the child with multiple developmental defects. Cytogenetic analysis revealed the trisomy 13 in the somatic cells (Patau's syndrome). What phenomenon has caused the defects?

A. Abnormal gametogenesis
B. Somatic mutation
C. Recessive mutation
D. Dominant mutation
E. Chromosomal mutation

31. A 25-year-old patient consulted a doctor about dysmenorrhea and infertility. Examination revealed that the patient was 145 cm high and had underdeveloped secondary sex characteristics, alar folds on the neck. Cytological study didn't reveal any Barr bodies in the somatic cells. What diagnosis was made?

A. Turner's syndrome
B. Klinefelter syndrome
C. Morris syndrome
D. Trisomy X syndrome

32. It was proved that a molecule of immature mRNA (precursor mRNA) contained more triplets than amino acids found in the synthesized protein. The reason for that is that translation is normally preceded by:

A. Replication
B. Mutation
C. Initiation
D. Reparation
E. Processing

33. Sex chromosomes of a woman didn't separate and move to the opposite poles of a cell during gametogenesis (meiosis). The ovum was

impregnated with a normal spermatozoon. Which chromosomal disease can be found in her child?

A. Turner's syndrome
B. Edwards' syndrome
C. Patau's syndrome
D. Cat cry syndrome
E. Down's syndrome

34. A 35-year-old male patient has been referred by an andrologist for the genetic counselling about deviations in physical and mental development. *Objectively*: the patient is tall, has an asthenic constitution, gynecomastia, mental retardation. Microscopy of the oral mucosa cells revealed sex chromatin (single Barr body) in 30% of cells. What is the most likely diagnosis?

A. Klinefelter syndrome
B. DiGeorge syndrome
C. Down syndrome
D. Recklinghausen's disease
E. Cushing pituitary basophilism

35. Examination of an 18-year-old girl revealed the following features: hypoplasia of the ovaries, broad S-shaped shoulders, narrow pelvis, shortening of the lower extremities, "sphinx neck". Mental development is normal. The girl was diagnosed with Turner's syndrome. What kind of chromosome abnormality is it?

A. Monosomy X
B. Trisomy X
C. Trisomy 13
D. Trisomy 18
E. Nullisomy X

36. Hypertrichosis has the Y-linked character. The father has hypertrichosis, and the mother is healthy. In this family, the probability of having a child with hypertrichosis is:

A. 0.5
B. 0.25
C. 0.125
D. 0.625
E. 1

37. An underage patient has signs of achondroplasia (dwarfism). It is known that this is a monogenic disease and the gene that is responsible for the development of such abnormalities is a dominant one. The development of that child's brother is normal. Specify the genotype of the healthy child:

A. aa
B. AA
C. Aa
D. AaBb
E. AABB

38. An 18-year-old male has been diagnosed with Marfan syndrome. Examination revealed a developmental disorder of connective tissue and eye lens structure, abnormalities of the cardiovascular system, arachnodactyly. What genetic phenomenon has caused the development of this disease?

A. Pleiotropy
B. Complementarity
C. Codominance
D. Multiple allelism
E. Incomplete dominance

39. Parents of a sick 5-year-old girl visited a genetic consultation. Karyotype investigation revealed 46 chromosomes. One chromosome of the 15th pair was abnormally long, having a part of the chromosome belonging to the 21st pair attached to it. What mutation occurred in this girl?

A. Translocation
B. Deletion
C. Inversion
D. Deficiency
E. Duplication

40. IgM to the rubella virus have been detected ni a pregnant woman. Based on these findings, the obstetrician-gynecologist recommended terminating the high probability of teratogenic on the fetus. It is important that specifically IgM have been detected, because immunoglobulins of this class:

A. are an indicator of a resent infection
B. have the largest molecular mass
C. can breach the placental barrier
D. are associated with anaphylactic reactions
E. are the main factor of the antiviral protection

**Exercise 3. Translate the following word combinations into Ukrainian.**

Result in disturbance of tryptophane absorption, pattern of deafness inheritance, undergo a mutation in DNA molecule, caused by rhesus incompatibility, an unremarkable family history, multiple developmental defects and intrauterine death, mitotically dividing cell, restore the initial structure with a specific enzyme, risk of lead poisoning, decreased indices of base metabolism and fat synthesis, number of nucleotide pairs, present in every generation, achieved via several mechanisms, occur at the following stage, fusion of the membrane saccule with the cell membrane, a stained blood smear.

**Exercise 4. Find synonyms to the following words.**

| | |
|---|---|
| next | nearly |
| fluid | production |
| excrement | find or detect |
| flagellum | speed or number of times |
| disorder or impairment | carry out |

**Exercise 5. Form adjectives from the nouns.**

| | |
|---|---|
| paroxysm | pole |
| abdomen | apyrexia |
| cell | genome |
| uterus | health |
| development | asymmetry |

**Exercise 6. Match the terms with their definitions.**

| |
|---|
| Nuclear envelope, endocytosis, ploidy, striped muscle, endoplasmic reticulum, mutagenesis, parasitism, protozoa, peroxisomes, synapsis |

1. _____ is a muscle where the cells exhibit cross-striations at the light microscope level. Striped muscle tissue is further sub classified on the basis of its location: skeletal muscle and cardiac muscle.

2. _____ are small, spherical, membrane-bound organelles which closely resemble lysosomes in size and electron microscopic appearance. They contain catalase, which regulates hydrogen peroxidase concentration, utilizing the oxidation of a variety of potentially toxic metabolites and ingested substances including phenols and alcohol.

3. _____ is a cellular process in which substances are brought into the cell. The material to be internalized is surrounded by an area of cell membrane, which then buds off inside the cell to form a vesicle containing the ingested material.

4. _____ is a process by which the genetic information of an organism is changed, resulting in a mutation. It may occur spontaneously in nature, or as a result of exposure to mutagens. It can also be achieved experimentally using laboratory procedures.

5. _____ consists of two layers of membrane (each layer of standard phospholipid bilayer structure) which represent a specialized part of the endoplasmic reticulum. The intermembranous (perinuclear) space is continuous with that of the endoplasmic reticulum, and the outer surface of the nuclear envelope is connected with ribosomes.

6. _____ is an ecological relationship between populations belonging to two different species, in which one species is physically and physiologically dependent of another species for a certain part of their life cycle.

7. _____ are single-celled eukaryotic organisms, with more than 65,000 species, many of which are parasites of humans and animals.

8. _____ is the number of complete sets of chromosomes in a cell, and hence the number of possible alleles for autosomal and pseudoautosomal genes.

9. _____ is a type of organelle found in eukaryotic cells, consists of an interconnecting network of membranous tubules and flattened sacs (cisternae) which ramifies throughout the cytoplasm. Much of its surface is studded with ribosomes giving a rough or granular appearance.

10. _____ (also called syndesis) is the pairing of two homologous chromosomes that occurs during meiosis.

**Exercise 7. Fill in the blanks with the words given in the box.**

| Cleft lip, recessive, predisposition, copies, sequence, defects, inheritance patterns, mutations, schizophrenia, chromosomal, single gene, individual chromosome |
|---|

**Genetic Disorders**

A genetic disorder is a disease caused by changes, or …….., in an individual's DNA …… . Genetic disorders can be divided into three different categories: single gene, ……. or complex disorders.

Single gene disorders are caused by ……. in one particular gene. There are over 10,000 human disorders caused by a change, known as a mutation, in a single gene. Individually, single gene disorders are each very rare, but as a whole, they affect about one per cent of the population. Since only a ……. is involved, these disorders often can be easily tracked through families and geneticists can predict the risk of them occurring in later generations. Single gene disorders can be divided into different categories: dominant, ……. and X-linked.

Chromosomal disorders result from changes in the number or structure of the chromosomes. Changes in the number of chromosomes happen when there are more or fewer ……. of a particular chromosome than usual. Changes in chromosome structure happen when the material in an …….. is disrupted or rearranged in some way. This may involve the addition or loss of parts of a chromosome.

Complex disorders (also known as multifactorial or polygenic) are those that are caused by the simultaneous effect of many different genes, often in a complex interaction with environmental and lifestyle factors such as diet. Many of the common diseases of adult life, such as diabetes mellitus, hypertension, ……, and most common developmental abnormalities, such as …….. and congenital heart defects, have a strong genetic component and are caused by more than one genetic change.

Because polygenic diseases involve more than one gene, …….. are diverse and complex. If a parent has a disease, it does not necessarily mean a child will develop the same disease. On the other hand, an individual may not be born with a disease but may be at a higher risk of developing it. This is known as genetic …….. or susceptibility.

**Exercise 8. Find the definition to the following genetic disorders:**

| | |
|---|---|
| Turner syndrome | 1) A condition in which a person has an extra chromosome 21 or an extra piece of a chromosome. This extra copy changes how a baby's body and brain develop. It can cause both mental and physical challenges during their lifetime |
| Down syndrome | 2) Also known as trisomy 18, is a rare but serious condition which affects how long a baby may survive |
| Kline-felter syndrome | 3) A serious rare genetic disorder caused by having an additional copy of chromosome 13 in some or all of the body's cells. This severely disrupts normal development and, in many cases, results in miscarriage, stillbirth or the baby dying shortly after birth |
| Patau's syndrome | 4) Women with this condition tend to be shorter than average and are usually unable to conceive a child (infertile) because of an absence of ovarian function |
| Edwards' syndrome | 5) An X-linked recessive condition due to a complete or partial insensitivity to androgens, resulting in a failure of normal masculinization of the external genitalia in chromosomally male individuals |
| Morris syndrome | 6) A congenital condition, where males are born with one or more extra X chromosomes. Adolescents and adults may notice that they have a small penis and testicles, less facial and body hair and larger breasts than expected |

**Exercise 9. Replace the words in bold type (1–10) with a word from the list a-j.**

| | |
|---|---|
| a) asymptomatic | f) hereditary |
| b) trauma | g) protozoa |
| c) epidemic | h) foetus |
| d) congenital | i) infectious |
| e) contagious | j) infestation |

(1) ***Dating from birth*** disease may be (2) ***passed from parents to offspring*** or may be the result of damage to the (3) ***unborn baby.*** (4) ***Physical damage*** may be the result of surgical operations, accidents, excessive temperatures, radiation or destructive chemicals. An infection or (5) ***invasion***

of living organisms may be the cause of disease. These living organisms include viruses, bacteria, (6) ***single-celled parasites***, fungi or animal parasites. Some diseases are (7) ***spread easily between people*** and the result may be a (8) ***large number of people suffering the disease***. Some diseases may (9) ***have no symptoms***. Some diseases may be (10) ***passed on by contact.***

**Exercise 10. Fill in the gaps with correct prepositions.**

A 5-year-old boy of African descent is presented … the emergency department … his parents. The child is clutching his abdomen and crying … pain in his belly. His mother reports intermittent episodes of jaundice with joint and bone pain since he was 5 months old. … presentation, the patient's vital signs are … normal limits. Physical examination reveals slight jaundice and pale conjunctiva. The spleen is tender and easily palpable. After a complete blood count with differential and an abdominal ultrasound, the patient is found to have sickle-cell disease … splenic infarct. A partial splenectomy is performed. After the operation, the physician provides vaccines … *Neisseria meningitidis, Haemophilus influenzae*, and *Streptococcus pneumoniae*. The picture shows a slide obtained … the resected portion of the patient's spleen. Dysfunction of the zone marked with which number predisposes the patient … the aforementioned infections?

**Exercise 11. What do these abbreviations stand for?**

WNL, CBC, SCD, ABP, ER, GH, Ig, PCR, Bx, Hb, CT.

**Exercise 12. Which terms are defined below?**

1) … refers to occlusion of the splenic vascular supply, leading to parenchymal ischemia and subsequent tissue necrosis.

2) **…** (formerly called Pfeiffer's bacillus) is a Gram-negative, coccobacillary, facultatively anaerobic capnophilic pathogenic bacterium of the family *Pasteurellaceae*. It was first described in 1892 by Richard Pfeiffer during an influenza pandemic.

3) … is a group of disorders that affects hemoglobin. People with this disease have atypical hemoglobin molecules called hemoglobin S.

4) … is a genus of gram-positive spherical bacteria.

5) … is a biological preparation that provides active acquired immunity to a particular infectious disease.

6) … is also known as icterus.

**Exercise 13. Give the correct answer.**

1. Which of the following is true about codons?

1) A codon is a series of 3 nitrogen bases
2) A codon is part of the mRNA
3) A codon specifies one amino acid
4) All of the answers are correct

2. What is the correct chronological order of the 3 steps of translation from mRNA to a polypeptide?

1) Initiation, elongation, termination
2) Initiation, termination, elongation
3) Termination, elongation, initiation
4) Elongation, initiation, termination

3. Which is a feature of the semi-conservative model of DNA replication?

1) DNA is copied short chunks at a time
2) the nucleotides make an impression and then copy a DNA strand
3) replicated DNA molecules have a parent strand and a daughter strand
4) each strand of the double helix is copied and then glued together

4. Which enzyme builds the daughter strand alongside the parent strand during cell replication?

1) DNA polymerase
2) RNA primase
3) DNA helicase
4) RNA ribozyme

5. The main difference between aerobic and anaerobic cellular respiration is that:

1) Aerobic respiration needs oxygen and anaerobic respiration does not.
2) Aerobic respiration needs water and anaerobic respiration does not.

3) Aerobic respiration needs ATP and anaerobic respiration does not.

4) None of these answers are correct

6. Which of the following is the form of energy used by cells?

1) Adenosine triphosphate
2) Nucleic acids
3) Carbohydrates
4) Lipids

7. Which of the following carbohydrates cannot be digested by humans?

1) Starch
2) Cellulose
3) Glucose
4) Fructose

8. A(an) _____ is a broader taxonomic order of classification than a(n)_____.

1) Kingdom, phylum
2) Order, class
3) Species, genus
4) Family, kingdom

9. What function does DNA play in the replication process?

1) the recipe for creating cell structure building blocks
2) the synthesis of protein strands
3) the structure that supports cell function
4) the transfer of nucleic acids

10. Which of the following statements is true about the sequence of steps in DNA replication?

1) rRNA comes before tRNA
2) mRNA comes before DNA
3) tRNA comes before mRNA
4) rRNA comes before DNA

**Exercise 14. Translate into English.**

1. Мукополісахаридоз належить до хвороб накопичення. Через відсутність ферментів порушується розщеплення полісахаридів. У хворих спостерігається підвищення виділення їх з сечею і нагромадження.

2. Внаслідок порушення розходження хромосом при мейозі утворилися: яйцеклітина тільки з 22 аутосомами і полярне тільце з 24 хромосомами.

3. При вивченні під електронним мікроскопом клітин підшлункової залози були знайдені структури, які поділяють клітину на велику кількість комірок, каналів, цистерн та поєднані з плазмолемою.

4. Під дією різних фізичних і хімічних агентів при біосинтезі ДНК у клітині можуть виникати ушкодження. Здатність клітин до виправлення ушкоджень у молекулах ДНК називається репарацією.

5. Дитині встановили діагноз гемолітичної хвороби новонароджених, викликаної резус-несумісністю.

6. Експериментально було встановлено кількість і послідовність амінокислот у молекулі гормону інсуліну.

7. Ця хвороба, викликана найпростішими, призвела до численних дефектів розвитку та внутрішньоматкової смерті.

8. При обстеженні дівчини 18 років знайдені такі ознаки: недорозвинення яєчників, широкі S-подібні плечі, вузький таз, вкорочення нижніх кінцівок, «шия сфінкса».

9. Під час операції в печінці хворого виявлені дрібні міхурці малих розмірів, з незначною кількістю рідини, які щільно прилягають один до одного.

10. Комплекс Гольджі виводить речовини із клітини завдяки злиттю мембранного мішечка з мембраною клітини, при цьому вміст мішечка виливається назовні.

# *UNIT 3*
# HISTOLOGY

**Exercise 1. Key words.**

| Noun | Verb | Adjective | Adverb |
|---|---|---|---|
| acinus | belong | biconcave | closely |
| band | blur | compound | diffusely |
| carnification | carry out | cryptal | eccentrically |
| damage | conduct | loose | extremely |
| dilation | detect | myeloid | insufficiently |
| infringement | impregnate | node-shaped | richly |
| layer | inherit | polygonal | surgically |
| magnification | penetrate | predominant | |
| permeability | prevent | preliminary | |
| palisade | proliferate | quantitative | |
| ratio | separate | rectangular | |
| smear | specify | significant | |
| specimen | underlie | spindle-shaped | |
| theca | | squamous | |
| variety | | stellate | |

**Exercise 2. Read the tests.**

1. A smear specimen of human red bone marrow shows, among myeloid cells and adipocytes, certain stellate cells with oxyphilic cytoplasm that are connected with their cellular processes. Name these cells:

A. Reticular cells
B. Fibroblasts
C. Macrophages
D. Dendritic cells
E. Osteocytes

2. The antigen of tissue compatibility of a child inherits from a father and mother. It is known that expression of paternal antigens in embryogenesis begins before time. But the immune system of a mother doesn't tear away an embryo. What organ first of all prevents an embryo rejection by a mother organism?

A. Chorion
B. Amnion
C. Allantois
D. Yolk sack
E. Umbilical Cord

3. A microslide shows a section of a bean-shaped organ with cortical and medullary substances. Its cortical substance contains separate spherical nodules 0.5–1 mm in diameter; its medullary substance consists of medullary cords. This histological section demonstrates the following organ:

A. Lymph node
B. Kidney
C. Thymus
D. Adrenal gland
E. Spleen

4. A specimen presents an endocrine system organ covered with a capsule made of connective tissue. Septa branches off from the capsule inwards and divides the organ into lobules. Each lobule consists of two cell types: neu-rosecretory pinealocytes (polygonal cells with processes) located in the cen-ter and gliacytes (astrocytes) located at the periphery. What organ is represented in this specimen?

A. Epiphysis
B. Pituitary gland
C. Hypothalamus
D. Thyroid gland
E. Adrenal medulla

5. One of the parts of the central nervous system has a layered arrangement of neurons, among which there are stellate, spindle-shaped, horizontal, and pyramidal cells. This structure corresponds with the following part of the nervous system:

A. Cerebral cortex
B. Medulla oblongata

C. Hypothalamus
D. Cerebellum
E. Spinal cord

6. A histological preparation demonstrates a gland. In its lobules there are acini with secretory cells that have two zones. Their basal zone is homogeneous basophilic, while the apical one is zymogenic oxyphilic. What organ has these key morphological features?
A. Pancreas
B. Liver
C. Parotid salivary gland
D. Sublingual salivary gland
E. Submandibular salivary gland

7. A histological specimen shows a significant amount of mucous connective tissue (Wharton's jelly), vessels, as well as remnants of yolk sac stalk and allantois. Name this organ:
A. Umbilical cord
B. Oesophagus
C. Ureter
D. Urethra
E. Vermiform appendix

8. Some diseases of the large intestine lead to the changes in the quantitative ratio between mucosal epithelial cells. What cell types are normally predominant in the crypt epithelium of the large intestine?
A. Goblet cells
B. Ciliated columnar epithelial cells
C. Endocrine cells
D. Cells with acidophilic granules
E. Poorly differentiated cells

9. An inflammation can be characterized by hemocapillary dilation in the affected area, decreased blood circulation, and increased vessel wall permeability. What cells play the key role in this process?
A. Tissue basophils
B. Fibroblasts
C. Plasma cells
D. Eosinophils
E. Macrophages

10. In loose connective tissue of the salivary glands oval middle size cells which synthesize antibodies are revealed. They have spherical eccentrically positioned nucleus with chromatin clumps resembling cartwheel or clock face. Name these cells.

A. Plasma cells
B. Adipose cells
C. Neutrophils
D. Fibroblasts
E. Macrophages

11. A histological specimen presents a receptor zone of a sensoepithelial sense organ. Cells of this zone are placed upon the basal membrane and include the following types: external and internal receptor cells, external and internal phalangeal cells, stem cells, external limiting cells and external supporting cells. The described receptor zone belongs to the following sense organ:

A. Acoustic organ
B. Visual organ
C. Gustatory organ
D. Equilibrium organ
E. Olfactory organ

12. Examination of a 43 y/o patient revealed that his stomach has difficulties with digestion of protein food. Gastric juice analysis revealed low acidity. Function of which gastric cells is disturbed in this case?

A. Parietal exocrinocytes
B. Main exocrinocytes
C. Mucous cells (mucocytes)
D. Endocrine cells
E. Cervical mucocytes

13. A microspecimen of the submandibular salivary gland shows some basket-shaped cells concentrated around the acini and excretory ducts. These cells surround bases of the serous cells and are called myoepitheliocytes. They relate to the following tissue:

A. Muscular tissue
B. Epithelial tissue
C. Neural tissue

D. Special connective tissue
E. Loose fibrous connective tissue

14. A histological specimen of an eyeball shows a biconvex structure, connected to the ciliary body with the fibrous strands of the ciliary zonule and covered on top with a transparent capsule. What structure is it?
A. Crystalline lens
B. Ciliary body
C. Sclera
D. Cornea
E. Vitreous body

15. Acute catarrhal inflammation of eye conjunctiva and nasal cavity mucosa develop every spring and summer in the patient during blossoming of herbs and trees. What cell elements activation and phagocytosis rest in the base of this syndrome?
A. Mast cells
B. Platelets
C. Macrophages
D. Neutrophils
E. Endothelial cells

16. In the histological connective tissue specimen that stained with hematoxylin eosin isogenic groups of cells surrounded by basophilic ground substance were revealed. Fibrous structures are not visible. What tissue is represented in the slide?
A. Hyaline cartilage
B. Elastic cartilage
C. Dense regular connective tissue
D. Fibrous cartilage
E. Bone tissue

17. Calcification of the intercellular substance of bone tissue is accompanied by the deposition of hydroxyapatite crystals along the collagen fibres. This process requires the presence of alkaline phosphatase in the intercellular substance. What cell produces this enzyme?
A. Osteoblasts
B. Osteocytes
C. Osteoclasts

D. Chondroblasts
E. Chondrocytes

18. In a conditional experiment, portions of the visceral layer of the ventral mesoderm, which lies adjacent to the endothelial tubes and formed in the cervical region of the embryo at the beginning of the third week of embryogenesis, were ruined. The formation of what muscle tissue will be damaged?

A. Cardiac muscle tissue
B. Skeletal muscle tissue
C. Smooth muscle tissue
D. Myoepithelial cells
E. Muscles of iris

19. Histological specimen shows organ parenchyma consisting of lymphoid tissue that forms lymph nodules; the nodules are located diffusely and have a central artery. What anatomical structure has such morphological characteristics?

A. Spleen
B. Tonsil
C. Lymph node
D. Thymus
E. Red bone marrow

20. One of the rules of surgery is to make incisions along the so-called Langer's lines (lines of skin tension). What tissue forms the strongest layer of the dermis – the reticular dermis?

A. Dense irregular connective tissue
B. Dense regular connective tissue
C. Reticular connective tissue
D. Loose fibrous connective tissue
E. Epithelial tissue

21. Histological specimen of the ovary shows large hollow structures. Primary oocyte within these structures is surrounded with transparent membrane and radiating crown and is situated in the cumulus oophorus, the wall is made of follicular cell layer and theca. What ovarian structure can be characterized by these morphological features?

A. Mature (tertiary) follicle
B. Primordial follicle
C. Primary follicle
D. *Corpus atreticum*
E. *Corpus luteum*

22. A patient at the oncology department has undergone radiation therapy. After that, morphology detected a significant disruption in the process of regeneration of epithelial layer in the small intestine mucosa. What cells of the epithelial membrane are damaged in this case?

A. Columnar epitheliocytes without a brush border, located in the crypts
B. Columnar epitheliocytes with a brush border
C. Goblet exocrinocytes
D. Exocrinocytes with acidophilic granulation (Paneth cells)
E. Endocrine cells

23. In a histological specimen an organ parenchyma is represented by lymphoid tissue which forms lymph nodules. These nodules are diffusely arranged and have a central artery. What organ has such structure?

A. Thymus
B. Tonsil
C. Lymph node
D. Spleen
E. Red bone marrow

24. Regional lymph nodes surrounding an infected wound are enlarged. Histological examination shows increased number of macrophages, lymphocytes, and lymphatic follicles in the cortical layer of the lymph nodes, as well as a large amount of plasma cells. What process in the lymph nodes is indicated by these histological changes?

A. Antigen stimulation
B. Acquired deficiency of lymphoid tissue
C. Congenital deficiency of lymphoid tissue
D. Transplant rejection
E. Neoplastic aberration

25. In a histological specimen of adrenal glands cortical substance one can see small polygonal cells forming round clusters and containing a small quantity of lipidic inclusions. What part of adrenal glands is represented in the specimen?

A. *Zona glomerulosa*
B. Intermediate zone
C. *Zona fasciculata*
D. *Zona reticularis*
E. Medullary substance

26. Histologic specimen of a kidney demonstrates cells closely adjoined to the renal corpuscle in the distal convoluted tubule. Their basement membrane is extremely thin and has no folds. These cells sense the changes in sodium content of urine and influence renin secretion occurring in juxtaglomerular cells. Name these cells.

A. Macula densa cells
B. Mesangial cells
C. Podocytes
D. Glomerular capillary endothelial cells
E. Juxtaglomerular cells

27. A microspecimen of heart shows rectangular cells from 50 to 120 micrometers large with central position of nucleus and developed myofibrils. The cells are connected by intercalated discs. These cells are responsible for the following function:

A. Function of heart contractions
B. Function of impulse conduction
C. Endocrine
D. Protective
E. Regenerative

28. A parenchyma sample was taken from a hematopoietic organ of a patient for diagnostic purposes. The sample contains megakaryocytes. What hematopoietic organ is it?

A. Red bone marrow
B. Spleen
C. Lymph node
D. Thymus
E. Tonsil

29. An electronic micrograph of the myocardium shows cells of dendritic form containing a few organelles, but with a well-developed granular endoplasmic reticulum and secretory granules. Name these cells.

A. Transitional atypical cells
B. Ventricular cardiac cells
C. Pacemaker cells
D. Secretory cardiac cells
E. Cells of His' fibers

30. In a histological specimen one can see an organ of the cardiovascular system. One of its membranes is formed of anastomosing fibres. They are formed of cells connected with the help of intercalated disks. What organ is it?

A. Artery of elastic type
B. Vein of muscular type
C. Artery of muscular type
D. Heart
E. Arteriole

31. In a heart specimen there are detected cells of squared shape, 80–120 micrometers in size, with a centrical nucleus and well-developed myofibrils connected with the help of intercalated disks. What function is connected with these cells?

A. Regenerative
B. Nerve impulses conduction
C. Endocrine
D. Protective
E. Heart contraction

32. In the histological section of a lymph node of an experimental animal in medullary cords after antigen stimulation a plenty of cells of such morphology have been detected: intensively basophilic cytoplasm, eccentrically located nucleus with chromatin, which is located as wheel spokes with a light site of cytoplasm near it. What cells are these?

A. Macrophages
B. Plasma cells
C. Fibroblasts
D. Adipocytes
E. Mast cells

33. Plasma membrane of erythrocyte, having significant plasticity, resistance, selective permeability, is characterized by the special structure of chemical components. What is situated on the external surface of the erythrocyte membrane?

A. Antigens Rh
B. Determinants of groups of blood
C. Receptors of immunoglobulins
D. Receptors of complement components
E. All listed

34. There are round structures of different sizes in the histological specimen of an endocrine gland. These structures' wall is formed of one layer of epithelial cells on the basic membrane, inside they contain homogeneous non-cellular mass. What gland is this?

A. Posterior lobe of pituitary gland
B. Adrenal gland, cortical substance
C. Parathyroid gland
D. Anterior lobe of pituitary gland
E. Thyroid gland

35. A patient has appealed to an otolaryngologist with complaints of dryness in the nose which caused unpleasant sensations. Examination of nasal cavity mucosa has shown function infringements of mucous glands located in it. In what layer of nasal cavity mucosa are these glands located?

A. Submucous layer
B. Epithelial plate
C. Muscle plate
D. Proper mucous plate
E. Fibrocartilaginous plate

36. Supravital methods of investigations of the cells and tissues are used in experimental medicine. However, living structures practically are colourless and indicate soft image. Supravital dyes are used for reinforcement of soft image of the investigated material. Indicate this dye.

A. Yanus green
B. Azur
C. Eozin
D. Fuchsin acid
E. Fuchsin alkaline

37. Many diseases are characterized by metabolic imbalance and accumulation of different organic compounds in tissue of a patient. What method reveals the amount and topography of determined chemical components?

A. Morphometry
B. Histochemical method
C. Decalcification
D. Autoradiography
E. Impregnation

38. The isotropic and anisotropic structures (dark and light area) are necessary to reveal for study of the muscular tissue. What type of microscope is used for this?

A. Light microscope
B. Dark-field microscope
C. Ultraviolet microscope
D. Fluorescence microscope
E. Polarized microscope

39. In a kidney histological specimen there has been presented a site of a distal tubule of nephron located between afferent and efferent arterioles. In the cells, which form the tubule wall, nuclei are thickened, basic membrane is absent. Name this structural formation.

A. Hurmagtig's cells
B. Dense macula cells
C. Mesangial cells
D. Juxtavascular cells
E. Juxtaglomerular cells

40. Intestinal epithelium is responsible for absorption of the products of digestion. What type of contacts between cells of an epithelial layer prevents penetration of molecules from external environment into the internal one through intercellular space?

A. Nexus
B. Contact as the lock
C. Desmosome
D. Zonula occludens
E. Hemidesmosome

**Exercise 3. Translate into Ukrainian.**

Tissue compatibility, increased vessel wall permeability, medullary cords, significant amount of connective tissue, thickened mucous membrane, a layered arrangement of neurons, remnants of yolk sac stalk and allantois, according to such features as size and form, rectangular cells from 50 to 120 micrometers large, closely adjoined, predominant in the crypt epithelium of the large intestine, spherical eccentrically positioned nucleus with chromatin clumps resembling cartwheel or clock face, hemocapillary dilation in the affected area, changes in the quantitative ratio, impregnated with a potassium dichromate solution, focus consists of a tough dry friable tissue with a dim surface, arranged in the form of a palisade, located as wheel spokes with a light site of cytoplasm near it.

**Exercise 4. Find synonyms to the following words.**

| | |
|---|---|
| capacity | site |
| knobble | fatty |
| picture | sample |
| fence | a number of |
| proportion | peculiarity |
| separate | tumour |

**Exercise 5. Fill the table with the missing parts of speech.**

| Verb | Noun | Adjective |
|---|---|---|
| | | changeable |
| impregnate | | |
| | | resolvable |
| specify | | |
| | connection | |
| decrease | | |
| | increasing | |

**Exercise 6. Match the parts of the sentences.**

| | | | |
|---|---|---|---|
| 1. | The number of chromosomes is | a | either alone of attached to messenger RNA molecules in stall spiral-shaped aggrega-tions called polyribosomes or polysomes. |
| 2. | Neurons of the spinal cord are surrounded by the layer of | b | constant for particular species. |
| 3. | Ribosomes may be present in the cytoplasm | c | neuroglial cells, which are called mantle gliocytes. |
| 4. | Specialized fibroblast is a large active cell by size 40–45 μm | d | the skin ectoderm, are situated in sweat, mammary, salivary and the other glands. |
| 5. | The respiratory alveolar cells are extremely thin squamous cells, | e | on the basis of random intro-duction of cysts, eggs or lar-vae into the digestive system of other species. |
| 6. | The circulatory system of tapeworms | f | whose nucleus is light, oval shape, contains 1–2 nucleolus |
| 7. | The skin constitutes a rela-tively impenetrable barrier to | g | most microorganisms unless breached by injury such as abrasion or burning. |
| 8. | The origin of parasitism is | h | which lie most of the surface of the alveoli. |
| 9. | Myoepithelial cells develop from | i | Turbellaria, Trematoda, Ces-toda |
| 10. | The phylum *Plathelminths* is divided into three classes: | j | is undeveloped. |

**Exercise 7. Fill in the blanks with the words given in the box.**

| |
|---|
| *Absorptive, submucosa, food, folds, nucleus, cytoplasm, juice, components, gland, cup* |

**Stomach**

Stomach is an expanded part of the digestive tube that lies beneath the diaphragm. It receives the bolus of macerated …… from the oesophagus.

The stomach is divided histologically into three regions on the basis of the type of …… that each contains: cardiac region (cardia), pyloric region (pylorus), fundic region (fundus).

The stomach consists of a mucosa, …… muscularis externa, and serosa. Examination of the inner surface of the empty stomach reveals a number of longitudinal …… or ridges called rugae. They are prominent in the narrower regions of the stomach but poorly developed in the upper portion.

The epithelium that lines the surface and the gastric pits of the stomach is simple columnar. The …… and Golgi apparatus of the surface mucous cells are located below the mucous ……. The basal pan of the cell contains small amounts of rough endoplasmic reticulum that may impart a light basophilia to the …… when observed in well-preserved specimens.

The mucous secretion from the surface mucous cells forms a thick, viscous, gel-like coat that adheres to the epithelial surface; thus, it protects against abrasion from rougher …… of the chyme. Additionally, its high bicarbonate concentration protects the epithelium from the acidic content of the gastric ……. The bicarbonate that makes the mucus alkaline is secreted by the surface cells but is prevented from mixing rapidly with the contents of the gastric lumen by its containment within the mucus coat.

The lining of the stomach does not function in …… capacity. However, some water, salts, and soluble drugs may be absorbed; alcohol and certain drugs, e. g., aspirin, enter the lamina propria by damaging the surface epithelium.

**Exercise 8. Find the definitions (1–8) to the given words (a–h):**

| | |
|---|---|
| 1. Cytoplasm | a) an important process for living things; it is how substances move in and out of cells |
| 2. Mitochondrion | b) a biological barrier that separates the interior of all cells from the outside environment (the extracellular space) which protects the cell from its environment |
| 3. Nucleus | c) the basic unit of life because it comes in discrete and easily recognizable package |
| 4. Genetic material | d) is a structure within or outside a cell, consisting of liquid or cytoplasm enclosed by a lipid bilayer |
| 5. Cell membrane | e) is a thick solution that fills each cell and is enclosed by the cell membrane. It is mainly composed of water, salts, and proteins |
| 6. Diffusion | f) a double membrane-bound organelle found in most eukaryotic organisms |
| 7. Vesicle | g) is an organelle found in most eukaryotic cells, whose primary functions are to store the cell's DNA, maintain its integrity, and facilitate its transcription and replication |
| 8. Cell | h) is the hereditary material found in the nucleus of eukaryotic cells (animal and plant) and the cytoplasm of prokaryotic cells (bacteria) that determines the composition of the organism. |

**Exercise 9. Complete the sentences using correct verb forms.**

1) If the patient hadn't had splenic infarct, he … (not undergo splenectomy)

2) The patient wouldn't have been diagnosed sickle-cell disease if CBC and ultrasound … (be WNL).

3) If a partial splenectomy … (not perform) the boy's condition … (complicate) by ruptured spleen, bleeding, and an abscess of the spleen.

4) The boy wouldn't … (predispose) to *Neisseria meningitidis, Haemophilus influenzae,* and *Streptococcus pneumoniae* if his spleen … (not damage).

5) I feel fine because I took the medicine. If I … (not take) the medicine, I would still be in pain.

**Exercise 10. What do the following medical abbreviations mean?**

| ABB |
|---|
| AF |
| AIDS |
| BBT |
| BP |
| Ca. |
| CBC |
| CNS |
| c/o |
| CSF |
| ESR |
| HBV |
| RBC |
| s. s. |
| WBC |
| XR |

**Exercise 11. Give the correct answer.**

1. The connective tissue cells responsible for storage of melanin pigments is

A. Pericyte
B. Melanocyte
C. Reticular cells
D. Melanophore

2. Which of the following statements concerning mast cells is false?

A. Found in groups along blood vessels

B. Secrete heparin and histamine
C. Involved in humoral immunity
D. Similar to basophils

3. What of the following is false about characteristics of yellow elastic fibres?
A. They appear as thin branching fibres
B. They resist acids and alkalises
C. They are stained by orcein stain
D. They give tissues strength and rigidity

4. Which one of the following is not an undifferentiated connective tissue cell?
A. Mast cells
B. Undifferentiated mesenchymal cells
C. Reticular cells
D. Pericytes

5. Which of the following statements is false concerning white fibrous connective tissue?
A. Type of connective tissue proper
B. Contains numerous collagenous fibres
C. Found in large blood vessels
D. Classified into regular and irregular types

6. What of the following is false about white collagenous fibres?
A. They are made of collagen proteins
B. They are demonstrated by orcein stain
C. They are affected by acids & alkalises
D. They give tissues strength frigidity

7. What of the following is false regarding areolar connective tissue?
A. Contains all types of connective tissue cells and fibres
B. Connects organs and tissues together
C. Fat cells are predominating
D. The most common type of connective tissue proper

8. What of the following is true about mast cells?
A. Are cells responsible for coloration of skin

B. Have metachromatic granules stained by toluidine blue
C. Have many lysosomes
D. Develop from B-lymphocytes

9. What of the following is true about the tendons?
A. Plasma cells inbetween
B. Regular bundles of elastic fibres
C. Irregular bundles of collagen fibres
D. Regular parallel bundles of collagen fibres

10. What connective tissue cells are found in brown adipose connective tissue?
A. Unilocular fat cells
B. Pericytes
C. Fibroblasts
D. Multilocular fat cells

**Exercise 12. Translate into English.**

1. Запалення характеризується зниженою циркуляцією крові та підвищеною проникністю стінок судин.

2. У жінки спостерігаються гіперемія яєчника, підвищення проникності гематофолікулярного бар'єру з послідовним розвитком набряку, інфільтрація стінки фолікула сегментоядерними лейкоцитами.

3. Гістологічний зразок показує значну кількість сполучної тканини, а також судин, залишки жовчно-кишкової протоки та алантоїс.

4. У гістологічному препараті представлений поперечний зріз стінки порожнистого органа, слизова оболонка якого вкрита багатошаровим плоским незроговілим епітелієм.

5. Тромбоцити підрозділяються за такими ознаками, як-от: розмір, форма, забарвлення грануломерів і гіаломерів.

6. Цей тип контактів між клітинами епітеліального шару запобігає проникненню молекул із зовнішнього середовища у внутрішнє через міжклітинний простір.

7. Мікрозразок серця показує прямокутні клітини від 50 до 120 мкм завбільшки з центральним положенням ядра та розвиненими міофібрилами.

8. Відповідно до морфологічної класифікації, екзокринні залози поділяються на прості та складні.

9. У гістологічному препараті паренхіма органа представлена часточками, які мають форму шестигранних призм і складаються з анастомозуючих пластинок, між якими лежать синусоїдні капіляри, що радіально сходяться до центральної вени.

10. Гістологічний зразок нирки демонструє клітини, що тісно прилягають до ниркового тільця у дистальному звивистому канальці.

# *UNIT 4*
# PHYSIOLOGY

## Chapter I

**Exercise 1. Key words**

| Noun | Verb | Adjective | Adverb |
|---|---|---|---|
| breakout | apply | broad | emotionally |
| decoction | carry out | derivative | previously |
| delivery | ensure | excitable | regularly |
| duration | experience | flat | |
| fatigability | induce | humid | |
| frequency | irritate | hypophysial | |
| lavage | maintain | projecting | |
| perception | protrude | protruding | |
| plaque | fatigability | reciprocal | |
| retention | remove | subsequent | |
| starvation | shiver | stubby | |
| thirst | worsen | voluntary | |

**Exercise 2. Read the tests.**

1. A patient with hypersecretion of gastric juice was recommended to exclude concentrated bouillons and vegetable decoctions from the diet because they stimulate gastric secretion. What is the dominating mechanism of stimulation of secretion in this case?

A. Stimulation of gastrin production by G-cells
B. Irritation of taste receptors
C. Irritation of mechanoreceptors of the oral cavity
D. Irritation of mechanoreceptors of the stomach
E. Stimulation of excretion of secretin in the duodenum

2. AB0 blood group is being determined. Erythrocyte agglutination occurred when standard sera of group I and group II were introduced into the blood being analysed, while group III serum caused no agglutination. What agglutinogens do these erythrocytes have?

A. B
B. A
C. A and B
D. C
E. D and C

3. Toxic damage to hepatic cells resulted in disruption of the patient's liver function and the patient developed oedemas. What changes of blood plasma are the main cause of oedema development?

A Decrease of albumin content
B. Increase of globulin content
C. Decrease of fibrinogen content
D. Increase of albumin content
E. Decrease of globulin content

4. After a trauma the patient has developed right-sided paralyses and disturbed pain sensitivity. On the left side no paralyses are observed, but pain and thermal sensitivity is disturbed. What is the cause of this condition?

A. Unilateral right-side spinal cord injury
B. Midbrain injury
C. Brainstem injury
D. Cerebellar injury
E. Motor cortex injury

5. A student, whose educational achievements throughout the semester were poor, feels emotionally tense during the final test. What is the primary cause that induced the leading mechanism of emotional tension in this case?

A. Lack of information
B. Lack of time
C. Lack of time and energy
D. Lack of energy
E. Lack of energy and information

6. A domestic accident has resulted in a significant blood loss in the patient, which was accompanied by a drop in blood pressure. What hormones ensure quick restoration of the blood pressure caused by a blood loss?

A. Adrenaline, vasopressin
B. Cortisol
C. Reproductive hormones
D. Oxytocin
E. Aldosterone

7. KCl concentration in a solution that surrounds an isolated cell was increased. How will resting membrane potential (RMP) and cell excitability change in this case?

A. RMP decreases, excitability increases
B. RMP increases, excitability increases
C. RMP increases, excitability decreases
D. RMP decreases, excitability remains unchanged
E. RMP and excitability remain unchanged

8. Usage of oral contraceptives with sex hormones inhibits secretion of the hypophyseal hormones. Secretion of which of the indicated hormones is inhibited while using oral contraceptives with sex hormones?

A. Follicle-stimulating
B. Vasopressin
C. Thyrotropic
D. Somatotropic
E. Oxytocin

9. During the breakout of acute respiratory infection in order to diagnose influenza the express-diagnosis based on revealing of specific viral antigen in the examined material (nasopharyngeal lavage) is carried out. Which reaction is used for this?

A. Immunofluorescence
B. Complement binding
C. Agglutination
D. Precipitation
E. Opsonization

10. A 38-year-old woman was admitted to the admission-diagnostic department with uterine bleeding. What are the most likely changes of blood?

A. Reduction of haematocrit rate
B. Increase of haematocrit rate
C. Leukopenia
D. Leukocytosis
E. Polycythaemia

11. Due to action of electric current on the excitable cell there appeared depolarization of its membrane. Movement of what ions through the membrane caused depolarization?

A. $Na^+$
B. $HCO_3^-$
C. $Ca_2^+$
D. $Cl^-$
E. $K^+$

12. The high level of Lactate Dehydrogenase (LDH) isozymes concentration showed the increase of $LDH_1$ and $LDH_2$ in a patient's blood plasma. Point out the most probable diagnosis:

A. Myocardial infarction
B. Skeletal muscle dystrophy
C. Diabetes mellitus
D. Viral hepatitis
E. Acute pancreatitis

13. Prolonged vomiting resulted in dehydration of the patient's body. Under these conditions, water retention in the body is ensured primarily due to increased secretion of the following hormone:

A. Vasopressin
B. Aldosterone
C. Natriuretic hormone
D. Adrenaline
E. Calcitonin

14. A 45-year-old woman presents with insufficient secretion of enterokinase enzyme. Enterokinase deficiency can cause disturbance of the following digestive function:

A. Protein hydrolysis
B. Carbohydrate hydrolysis
C. Lipid hydrolysis
D. Vitamin absorption
E. Lipid absorption

15. A patient after hypertension stroke does not have voluntary movements in his right arm and leg with the increased muscle tone in these extremities. What type of dysfunction of the nervous system is it?
A. Central paralysis
B. Peripheral paralysis
C. Peripheral paresis
D. Reflex paresis
E. Central paresis

16. A person has increased pulmonary ventilation due to physical exertion. What indicator of external respiration will be significantly increased compared to the resting state?
A. Respiratory volume
B. Vital lung capacity
C. Inspiratory reserve volume
D. Expiratory reserve volume
E. Total lung capacity

17. ECG study showed that the T-waves were positive in the standard extremity leads, their amplitude and duration were normal. The right conclusion would be that the following process runs normally in the heart ventricles:
A. Repolarization
B. Depolarization
C. Excitement
D. Contraction
E. Relaxation

18. In the course of an experiment a skeletal muscle is being stimulated by a series of electric impulses. What type of muscle contraction will arise, if every subsequent impulse comes in the period of shortening of the previous single muscle contraction?
A. Holotetanus

B. Partial tetanus
C. Asynchronous tetanus
D. A series of single contractions
E. Muscle contracture

19. When measuring power inputs of a man by the method of indirect calorimetry the following results were obtained: 1000 ml oxygen consumption and 800 ml carbon dioxide liberation per minute. The man under examination has the following respiratory coefficient:
A. 0.8
B. 1.25
C. 0.9
D. 0.84
E. 1.0

20. A concentrated solution of sodium chloride was intravenously injected to an animal. This caused decreased reabsorption of sodium ions in the renal tubules. It is the result of the following changes of hormonal secretion:
A. Aldosterone reduction
B. Aldosterone increase
C. Vasopressin reduction
D. Vasopressin increase
E. Reduction of atrial natriuretic factor

21. During the influenza epidemic 40% of pupils who didn't go in for sports were affected by the disease, and among the pupils who regularly did physical exercises this index was only 20%. What adaptive mechanisms determined such a low sickness rate of pupils participating in the sports?
A. Cross adaptation
B. Specific adaptation
C. Physiological adaptation
D. Biochemical adaptation
E. Genetic adaptation

22. In the experiment on the animal the part of the cerebral cortex hemispheres was removed. It caused elimination of previously formed conditioned reflex to the light irritation. What part of the cortex was removed?

A. Occipital cortex
B. Precentral convolution
C. Postcentral convolution
D. Limbic cortex
E. Temporal lobe

23. Inhibition of alpha-motoneuron of the extensor muscles was noticed after stimulation of alpha-motoneuron of the flexor muscles during the experiment on the spinal column. What type of inhibition can this process cause?
A. Reciprocal
B. Presynaptic
C. Depolarization
D. Recurrent
E. Lateral

24. In the course of an experiment a skeletal muscle is being stimulated by a series of electric impulses. What type of muscle contraction will arise, if every subsequent impulse comes in the period of relaxation of single muscle contraction?
A. Partial tetanus
B. Holotetanus
C. A series of single contractions
D. Muscle contracture
E. Asynchronous tetanus

25. A pregnant woman had her blood group identified. Reaction of erythrocyte agglutination with standard serums of 0α/β(I), Bα (III) groups didn't proceed with standard serum of Aβ (II) group. The blood group under examination is:
A. Aβ (II)
B. 0α/β (I)
C. Bα (III)
D. AB (IV)

26. Blood group of a 30-year-old man was specified before an operation. His blood is Rh-positive. Reaction of erythrocyte agglutination was absent with standard sera of 0α/β (I), Aβ (II), Bα (III) groups. The blood under examination is of the following group:

A. 0α/β (I)
B. Aβ (II)
C. Bα (III)
D. AB (IV)

27. Students who are taking examinations often have dry mouth. The mechanism that causes the state is the realization of the following reflexes:
A. Conditioned sympathetic
B. Unconditioned parasympathetic
C. Conditioned parasympathetic
D. Unconditioned sympathetic
E. Unconditioned peripheral

28. Vagus branches that innervate the heart are being stimulated in the course of an experiment. As a result of it the excitement conduction from atria to the ventricles was brought to a stop. It is caused by electrophysical changes in the following structures:
A. Atrioventricular node
B. His' bundle
C. Sinoatrial node
D. Ventricles
E. Atria

29. A man weighs 80 kg, after long physical activity his circulating blood volume is reduced down to 5.4 l, haematocrit makes up 50%, whole blood protein is 80 g/l. These blood characteristics are determined first of all by:
A. Water loss with sweat
B. Increased number of erythrocytes
C. Increased protein concentration in plasma
D. Increased circulating blood volume
E. Increased diuresis

30. The temperature of the ambient environment is 38°C and relative air humidity is 50%. What ways of heat emission provide maintaining a constant temperature of the human body?
A. Evaporation
B. Radiation
C. Heat conduction

D. Convection
E. Convection and conduction

31. The minute blood volume in a patient with a transplanted heart has increased as a result of physical activity. What regulative mechanism is responsible for these changes?
A. Catecholamines
B. Sympathetic unconditioned reflexes
C. Parasympathetic unconditioned reflexes
D. Sympathetic conditioned reflexes
E. Parasympathetic conditioned reflexes

32. A patient came to the hospital complaining about quick fatigability and apparent muscle weakness. Examination revealed an autoimmune disease that causes disorder of functional receptor condition in neuromuscular synapses. What transmitter will be blocked?
A. Acetylcholine
B. Noradrenalin
C. Dopamine
D. Serotonin
E. Glycine

33. A man has normal sensitivity of his finger skin, however he doesn't sense his wedding ring around the finger. What process induced by wearing of the ring has caused this phenomenon?
A. Receptor adaptation
B. Development of the fibrous tissue
C. Abnormality of the epidermis structure
D. Impaired circulation
E. Abnormality of the receptor structure

34. It was established that agglutination of the recipient's blood erythrocytes had been caused by the standard sera from the I and II groups. Serum from the III group as well as anti-Rh serum hadn't provoked any agglutination. Which blood group and rhesus is allowed to be transfused to this recipient?
A. B,α (III) Rh
B. A,β (II) Rh
C. 0,α, β (I) Rh+

D. AB (IV), Rh+
E. AB (IV), Rh-

35. During an experiment the myotatic reflex has been studied in frogs. After extension in a skeletal muscle its reflex contraction was absent. The reason for it might be a dysfunction of the following receptors:
A. Muscle spindles
B. Nociceptors
C. Articular
D. Golgi tendon organs
E. Tactile

36. Inhibition of alpha-motoneuron of the extensor muscles was noticed after stimulation of alpha-motoneuron of the flexor muscles during the experiment on the spinal column. What type of inhibition can this process cause?
A. Reciprocal
B. Presynaptic
C. Depolarization
D. Recurrent
E. Lateral

37. As a result of long-term starvation the glomerular filtration of a man was accelerated by 20%. The most probable cause of filtration changes under such conditions is:
A. Fall of oncotic pressure of blood plasma
B. Rise of systemic arterial pressure
C. Increased permeability of renal filter
D. Growth of filtration coefficient
E. Increase of renal plasma flow

38. A newborn child suffers from milk curdling in the stomach, this means that soluble milk proteins (caseins) transform to insoluble proteins (paracaseins) by means of calcium ions and a certain enzyme. What enzyme takes part in this process?
A. Renin
B. Pepsin
C. Gastrin
D. Secretin
E. Lipase

39. Spasm of smooth muscle of bronchi developed in the patient. Usage of what membrane cytoreceptors' activators is physiologically valid to decrease attack?

A. Beta-adrenoreceptors
B. Alpha-adrenoreceptors
C. Alpha- and beta-adrenoreceptors
D. H-cholinoreceptors
E. M-cholinoreceptors

40. Surgical removal of a part of the stomach resulted in disturbed absorption of vitamin $B_{12}$, it is excreted with faeces. The patient was diagnosed with anaemia. What factor is necessary for absorption of this vitamin?

A. Gastromucoprotein
B. Gastrin
C. Hydrochloric acid
D. Pepsin
E. Folic acid

**Exercise 3. Translate the following word-combinations.**

Yellow spots and streaks in the aortic intima, expiratory reserve volume, electric current, lowered concentration of calcium ions, air moisture, adrenal cortex, external membrane of excitable cell, loss of touch sensitivity, systemic blood pressure, atrioventricular node, voluntary movements, residual volume, frequency of cardiac contraction, suffer from milk curdling in stomach, food intake, mental activity, vegetable decoctions, abnormalities of the sound perception, disturbed absorption.

**Exercise 4. Match the synonyms:**

| | |
|---|---|
| Injection | Counteragent |
| Healing | Remedy |
| Antidote | Nasal catarrh |
| Painkiller | Sac |
| Rhinitis | Medical history |
| Cyst | Bloating |
| Distention | Shot |
| Anamnesis | Therapeutic |
| Bile | Anesthetic |
| Medicine | Gall |

**Exercise 5. Fill the table with the missing parts of speech:**

| verb | noun | adjective |
|---|---|---|
| excite | | |
| | use | |
| | | sensitive |
| | suffering | |
| penetrate | | |
| | prevention | |
| | _____ | abnormal |
| apply | | |
| | consumption | |
| | | systemic |

**Exercise 6. Find the definitions to the given words:**

| | |
|---|---|
| Intrinsic factor | a) the process that occurs if an antigen is mixed with its corresponding antibody |
| Agglutination | b) when a change occurs inside a cell that causes the distribution of electric charges to alter, leaving the cell with a less negative charge than the outside |
| Evaporation | c) the proportion of the blood cells by volume in the total blood volume |
| Haematocrit | d) a muscular spasm of the entire body |
| Cross-adaptation | e) a glycoprotein produced by the parietal cells of the stomach |
| Holotetanus | f) a stage of an action potential in which the cell experiences a decrease of voltage due to the efflux of potassium (K+) ions along its electrochemical gradient |
| Depolarization | g) A temporary loss of sensitivity to a stimulus, especially an odour or a taste, following exposure to a different stimulus |
| Repolarization | h) a process by which an element or compound transitions from its liquid state to its gaseous state below the temperature at which it boils |

**Exercise 7. Replace the words in bold with the synonymous word/phrases and answer the question.**

A 20-year-old woman is brought to the **emergency department** with a **puncture** wound on the right side of her chest. She was walking to her apartment when she was assaulted. As she resisted to give up her purse, the assailant stabbed her in the chest with a knife and ran away. She is in severe respiratory distress. Her heart rate is 140/min, respiratory rate is 28/min, and blood pressure is 145/65 mm Hg. The pulse oximetry shows an oxygen saturation of 84%. An oval puncture wound is seen on the right **lateral aspect** of her chest and she is **stuporous.** The heart sounds are normal and no jugular venous distension is seen. Distant breath sounds are present on the right. Which of the following changes during inspiration explains her **breathing difficulty?**

A. Diminished inspiratory force due to pain
B. Decreased intrapleural pressure
C. Equal intrapleural and atmospheric pressures
D. Paralysis of the diaphragm
E. Increased elastic force of the chest wall pulling it inwards

**Exercise 8. Fill in the gaps with the words from the box and answer the question**.

| *multivitamin, consciousness, tachycardic, spells, assessment, tongue, occasions, carcinoma, dizziness, significant, bilaterally, urgent, anxious, medulla* |
|---|

A 45-year-old man walks into an (1) _____ care clinic complaining of a headache and (2) _____ . Earlier today he was in his normal state of health when symptoms started, and he reports that symptoms lasted about 20 minutes. He did not lose (3) _____or vomit. He also mentions that he was sweating a lot at that time. He has had similar dizzy spells on three separate (4) _____ . His past medical history is (5) _____ for a total thyroidectomy 10 years ago for (6) _____ . He takes levothyroxine and a (7) _____ every day. Several family members seem to suffer from similar (8) _____. At the clinic, his blood pressure is 140/90 mm Hg, his heart rate is 120/min, his respiratory rate is 18/min, and his temperature is 36.6°C (98.0°F). On physical exam, he appears quite (9) _____ and uncomfortable. His heart rate is (10) _____with normal rhythm and his lungs are clear to auscultation (11)_____ . Small nodules are observed on his buccal mucosa and (12) _____. The patient is referred to an endocrinologist for

further (13) _____ and CT. On CT, a mass is observed involving the (14) _____of his right adrenal gland. Which of the following additional symptoms is associated with this patient's condition?

A. Bronchospasm
B. Decreased cardiac contractility
C. Pale skin
D. Bradycardia
E. Pupillary constriction

**Exercise 9. Fill in appropriate prepositions.**

**Diffusion**

All molecules and ions … the body fluids, including water molecules and dissolved substances, are … constant motion, each particle moving its own separate way. Motion of these particles is what physicists call "heat"—the greater the motion, the higher the temperature—and the motion never ceases … any condition except … absolute zero temperature. When a moving molecule, A, approaches a stationary molecule B, the electrostatic and other nuclear forces of molecule A repel molecule B, transferring some of the energy of motion of molecule A … molecule B. Consequently, molecule B gains kinetic energy … motion, while molecule A slows down, losing some of its kinetic energy. Thus, a single molecule … a solution bounces among the other molecules first … one direction, then another, then another, and so forth, randomly bouncing thousands of times each second. This continual movement of molecules among one another … liquids or gases is called diffusion.

Ions diffuse …. the same manner as whole molecules, and even suspended colloid particles diffuse … a similar manner, except that the colloids diffuse far less rapidly than molecular substances because … their large size.

**Exercise 10. Explain the meaning of the following words.**

Saturate —
Desaturate —
Saturated —
Unsaturated —
Saturation —
Desaturation —
Saturator —

**Exercise 11. Give the correct answer.**

1. Which of the following ions is at a higher concentration in the intracellular fluid compartment compared to the extracellular fluid compartment?

A. Calcium
B. Potassium
C. Sodium
D. Chloride

2. Which of the following heat production mechanisms is directly associated with cold stress?

A. Brown adipose tissue catabolism
B. Movement
C. Organ basal metabolic rate
D. Thermic effect of food
E. Skeletal metabolism associated with exercise

3. Which of the following describes muscle contractions that produce heat but no work?

A. Cold stress
B. Active metabolism
C. Exercise
D. Shivering
E. Basal metabolism

4. Why is an increase in body temperature, such as a fever, advantageous to body homeostasis?

A. Fever decreases production of Tumour Necrosis Factor
B. Fever decreases neutrophil extravasation
C. Fever decreases lymphocyte proliferation
D. Fever decreases the growth of certain bacteria
E. Fever decreases production of interleukin-1 beta

5. By which peripheral signalling mechanism do the pyrogenic cytokines induce fever?

A. PGE2 produced by liver or lung macrophages
B. Increased COX2 in brain endothelial cells
C. Increased COX2 by astrocytes via RANKL
D. Increased COX2 in brain perivascular macrophages

E. Increased COX2 by astrocytes via receptor activator of nuclear factor-κ B

6. Why is it important that blood pH remains within tight parameters?
A. Cells regulate blood pH
B. Blood feels the effects of the pH of the entire body
C. An abnormal blood pH cannot be buffered
D. An altered blood pH affects the entire body
E. There are no compensatory mechanisms to restore the pH toward normal

7. What are buffers?
A. Substances that bind to hydrogen ions and decrease the number of free protons in the solution
B. They are always bicarbonate
C. Substances that change the pH from acidic to basic
D. Substances that remove the hydrogen ions from the tissues
E. Substances that remove the hydrogen ions from the blood

8. Which of the following is NOT a part of the bone formation?
A. Maturation of bone
B. Bone remodelling
C. Collagen deposition
D. Crystal seeding
E. Addition of ground substance

9. Which of the following will increase blood flow through an artery?
A. Increased pressure at the beginning of the artery
B. Increased pressure at the end of the artery
C. Increased resistance along the artery
D. Increased length of the artery
E. Decrease in diameter of the artery

10. What is the mean arterial pressure in a person who has an arterial blood pressure of 145/90 mmHg measured by a stethoscope and sphygmomanometer?
A. 72 mmHg
B. 80 mmHg
C. 55 mmHg

D. 108 mmHg
E. 138 mmHg

**Exercise 12. Translate the sentences into English.**

1. При гіперсекреції шлункового соку харчова грудка, що потрапляє у дванадцятипалу кишку, має занадто низький Ph.

2. Утворення меланіну регулюється низкою гормонів, що виділяються після перебування на сонці.

3. Для перенесення речовин на порівняно невеликі відстані існують процеси конвекційного транспорту: легенева вентиляція і транспорт газів кров'ю.

4. Акт вдиху є активним процесом, у здійсненні якого важливе значення має зміна об'єму грудної порожнини.

5. Мозкові нерви передають інформацію від органів тіла і зовнішніх подразників до мозку.

6. Збудливими структурами називають такі, які передають інформацію або викликають функцію шляхом зміни мембранних потенціалів.

7. Рефлекс — це відповідь організму на подразнення за участі ЦНС, що забезпечує пристосувальну реакцію організму на зміни зовнішнього або внутрішнього середовища.

8. У гіпоталамусі відбувається секреція тиреоліберину, який з кров'ю транспортується до аденогіпофіза.

9. У різних людей властивості дихальних систем різняться, причиною чого є спадковість і розбіжності у способі життя.

10. Здоровий спосіб життя та заняття спортом сприяють розвитку органів дихання і підвищують ефективність їхньої роботи.

# Chapter II

**Exercise 1. Key words**

| Noun | Verb | Adjective | Adverb |
|---|---|---|---|
| accommodation | accompany | deteriorating | functionally |
| consequence | dilate | executive | immediately |
| contraction | evaluate | focal | mitotically |
| disruption | extend | intermittent | likely |
| disturbance | indicate | previous | primarily |
| effort | memorize | profuse | provisionally |
| graft | process | recurrent | subcutaneously |
| gyrus | reveal | residual | sharply |
| overstretching | submerge | | transversely |
| putrefaction | | | |
| sequence | | | |
| shift | | | |
| tinnitus | | | |

**Exercise 2. Read the tests:**

1. The doctor evaluates his patient's spirography. One of the evaluation parameters represents the normal amount of air displaced between normal inhalation and exhalation without any extra efforts or appointments. Which of the following is being evaluated in this case?

A. Total volume
B. Vital volume
C. Tidal lung capacity
D. Residual volume
E. Inspiratory capacity

2. A patient with an injury of the Psoas major muscle was delivered to the traumatology centre. The patient has lost the ability to extend the lower leg at the knee joint. What nerve is damaged in this case?

A. Femoral nerve
B. Iliohypogastric nerve
C. Ilioinguinal nerve
D. Genitofemoral nerve
E. Obturator nerve

3. A group of researchers aimed to study cardiac physiology found that overstretching of atria in the heart leads to decreased sodium reabsorption in the distal convoluted tubule and increase in glomerular filtration rate. Which of the following is the most likely cause of physiologic effects discovered by researchers?

A. Natriuretic peptide
B. Aldosterone
C. Angiotensin
D. Antidiuretic hormone
E. Renin

4. A 14-year old girl presents to the emergency department for evaluation of an “infected leg”. She states there is no history of trauma but mentions that she had a history — of sickle cell disease. On physical examination, her upper part of right shin is very painful, red, swollen and hot. Her temperature is 39.2°C. An X-ray shows focal bony lysis and loss of trabecular architecture in the metaphysis of right tibia, increased activity of which of the following cells is the most likely cause of bone reabsorption in this patient?

A. Osteoclasis
B. Chondroblasts
C. Osteocytes
D. Chondrocytes
E. Osteoblasts

5. A person has memorized a phone number for a short period of time (a few seconds). After making a call the person was unable to reproduce this sequence of numbers. In this case the process of memorizing was based on the following type of memory:

A. Short-term memory

B. Iconic memory
C. Medium-term memory (episodic buffer)
D. Long-term memory
E. Secondary and tertiary memory

6. Analysis detects glucose and amino acids in the primary urine. In the residual urine they are absent due to tubular reabsorption of these substances. Where in the nephron does this process occur?
A. Proximal convoluted tubule
B. Distal convoluted tubule
C. Henle's loop
D. Collecting duct
E. Macula densa

7. Proliferation of connective tissue in the liver parenchyma (fibrosis) that results from chronic disorders causes a blood flow disturbance in the classical hepatic lobules. Describe the blood flow direction in these lobules:
A. From the periphery to the centre
B. From the base to the apex
C. Around the lobule
D. From the centre to the periphery
E. From the apex to the base

8. A patient suffers from disrupted patency of the airways at the level of small and medium-sized bronchial tubes. What changes of acid-base balance can occur in the patient?
A. Respiratory acidosis
B. Respiratory alkalosis
C. Metabolic acidosis
D. Metabolic alkalosis
E. Acid-base balance remains unchanged

9. Upon toxic damage of hepatic cells resulting in disruption of liver function the patient developed oedemata. What changes of blood plasma are the main cause of oedema development?
A. Decrease of albumin content
B. Increase of globulin content
C. Decrease of fibrinogen content

D. Increase of albumin content
E. Decrease of globulin content

10. A patient with massive burns received a skin graft from a donor. On the 8th day after the grafting, the transplant became oedematous and discoloured. On the 11th day transplant rejection started. What cells take part in this process?
A. T lymphocytes
B. Eosinophils
C. B lymphocytes
D. Erythrocytes
E. Basophils

11. A 7-year-old girl has signs of anaemia. Laboratory testing determined the deficiency of pyruvate kinase in her erythrocytes. In this case the main role in anaemia development belongs to the disturbance of a certain process. What process is disturbed in this girl?
A. Anaerobic glycolysis
B. Amino acid deamination
C. Oxidative phosphorylation
D. Tissue respiration
E. Peroxide decomposition

12. A 53-year-old man is diagnosed with Paget's disease. Concentration of oxyproline in daily urine is sharply increased, which primarily means intensified disintegration of:
A. Collagen
B. Keratin
C. Albumin
D. Haemoglobin
E. Fibrinogen

13. A 25-year-old woman complains of deteriorating vision. Examination revealed a defect in accommodation, the pupil is dilated and unresponsive to light. What muscles are functionally disturbed in this case?
A. Iris sphincter muscle, ciliary muscle
B. Iris sphincter and iris dilator muscles
C. Iris dilator muscle, ciliary muscle

D. Superior oblique muscle, ciliary muscle
E. Lateral rectus muscle, iris sphincter muscle

14. 24 hours after an appendectomy the patient's blood test shows neutrophilic leukocytosis with a regenerative shift. What is the most likely mechanism of absolute leukocytosis development in the patient's peripheral blood?
A. Intensification of leukopoiesis
B. Immunity activation
C. Leukocyte redistribution
D. Decreased leukocyte disintegration
E. Deceleration of leukocyte migration to the tissues

15. During the exercise testing on a training bicycle, the patient's respiration rate increased. What is the main cause of the changed activity in the respiration centre in this case?
A. Increase of $CO_2$ tension in the blood
B. Decrease of $CO_2$ tension in the blood
C. Increase of blood adrenaline levels
D. Increase of $O_2$ tension in the blood
E. Decrease of $O_2$ tension in the blood

16. A 46-year-old man was brought to the hospital specializing in the nervous system diseases. The man was provisionally diagnosed with cerebral haemorrhage. The patient presents with frequent spontaneous limb movements intermittent with the state of limb muscle hypertonia. These signs can be explained by the damage to the following brain structures:
A. Basal ganglia
B. Brain stem
C. Hypothalamus
D. Hypophysis
E. Frontal cortex

17. Immediately after moving from horizontal to vertical position, the heart rate of a 23-year-old man increased by 15 beats per minute, his systolic pressure remained unchanged, while his diastolic pressure increased by 10 mm Hg. What reflex response of the executive structures caused this increase in the diastolic pressure?
A. Constriction of the resistance vessels

B. Increase of the cardiac output
C. Constriction of the resistance and capacitance vessels
D. Constriction of the capacitance vessels
E. Increase of the stroke volume

18. Blood test shows the following: sodium — 115 mmol/T, chlorides — 85 mmol/T, glucose — 6 mmol/T, total protein — 65 g/L. The first consequence of such changes will be the decrease of:
A. Osmotic blood pressure
B. Erythrocyte sedimentation rate
C. Oncotic blood pressure
D. Blood pH
E. Circulating blood volume

19. In an experiment, a frog neuromuscular preparation had been processed with a curare-like substance, which led to the disappearance of muscle contractions in response to electrical stimulation. What function of the muscle cell membrane is disrupted by curare-like substances?
A. Reception of the mediators in the neuromuscular synapse
B. Creation of the electric potentials on the both sides of the membrane
C. Maintenance of the internal cell structure, its cytoskeleton
D. Creation of a barrier between the intracellular environment and surrounding intercellular fluid
E. Change in the permeability for different substances

20. Among lymphocytes there is a population of cells that have membrane receptors to IgM, activated in response to certain antigens, reproduce mitotically, differentiate into plasma cells that produce antibodies (immunoglobulins). Name these cells:
A. B-lymphocytes
B. Memory T-cells
C. Killer T-cells
D. Suppressor T-cells

21. A patient came to the hospital complaining of abdominal distension, diarrhoea, and meteorism that occur after eating protein-rich food, which indicates disturbed protein metabolism and intensified protein putrefaction. What substance is the product of this process in the intestine?

A. Indole
B. Bilirubin
C. Cadaverine
D. Agmatine
E. Putrescine

22. A patient complains of acute increase in diuresis (up to 5–7 litres of urine per 24 hours). Examination revealed decreased secretion of vasopressin in this patient. What cells have insufficient secretory activity in this case?
A. Neurosecretory cells of the hypothalamus
B. *Pars tuberalis* cells
C. Endocrinocytes of the anterior pituitary
D. Endocrinocytes of the intermediate pituitary
E. Pituicytes

23. Arterial blood pH is 7.4; primary urine pH is 7.4; final urine pH is 5.8. Decreased pH of the final urine results from the secretion of a certain substance in the nephron tubules. Name this substance:
A. Hydrogen ions
B. Creatinine
C. Hydrogen carbonate ions
D. Potassium ions
E. Urea

24. A 49-year-old woman developed a leg oedema after a long time spent standing. What is the likely cause of oedema development?
A. Increase of hydrostatic venous pressure
B. Increase of oncotic blood plasma pressure
C. Increase of arterial pressure
D. Decrease of hydrostatic venous pressure
E. Decrease of hydrostatic arterial pressure

25. In an experiment on an isolated squid giant axon submerged in a salt solution, the extracellular potassium ions concentration was increased to the level of the intracellular potassium ions concentration. What changes in the membrane potential will occur in this case?
A. Potential disappears
B. Potential decreases

C. Potential increases
D. Potential remains unchanged
E. Potential first decreases and then increases

26. A woman with enteritis accompanied by severe diarrhoea presents with the loss of water in the extracellular space, increased water content in the cells, and decreasing blood osmolarity. Name this type of water — electrolyte imbalance:
A. Hypoosmolar hypohydration
B. Hyperosmolar hypohydration
C. Isoosmolar hypohydration
D. Hypoosmolar hyperhydration
E. Hyperosmolar hyperhydration

27. Due to a cerebral haemorrhage, the patient developed a disturbed speech perception (sensory aphasia). What brain structure is likely to be damaged in this case?
A. Superior temporal gyrus
B. Inferior frontal gyrus
C. Superior frontal gyrus
D. Inferior temporal gyrus
E. Posterior central gyrus

28. A lab rat has subcutaneously received mercury (II) chloride in the amount of 5 mg/kg. 24 hours later the plasma creatinine concentration increased several times. What mechanism of retention azotaemia is observed in this case?
A. Decreased glomerular filtration
B. Increased creatinine production in muscle
C. Increased glomerular filtration
D. Increased creatinine production in renal tubules
E. Increased creatine reabsorption

29. One of the causes of pernicious anaemia is disturbed synthesis of transcorrin — Castle's intrinsic factor — by the parietal cells of the stomach. What substance is called Castle's extrinsic factor?
A. Cobalamin
B. Riboflavin
C. Folic acid

D. Pyridoxine
E. Biotin

30. A 3-year-old child has been brought by an ambulance to the intensive care unit of the infectious diseases' hospital. On examination the child is in severe condition, skin and mucosa are dry, tissue turgor is reduced. The patient's history states that profuse diarrhoea and recurrent vomiting were observed throughout the previous day after the child had eaten food products of poor quality. What type of salt and water imbalance is likely to have developed in the patient?
A. Hypoosmolar dehydration
B. Hyperosmolar dehydration
C. Isooemolar dehydration
D. Hypoosmolar hyperhydration
E. Isoosmolar hyperhydration

31. A 16-year-old adolescent is diagnosed with hereditary UDP (uridine di-phosphate) glucuronyl transferase deficiency. Laboratory tests revealed hyperbilirubinemia caused mostly by increased blood content of the following substance:
A. Unconjugated bilirubin
B. Conjugated bilirubin
C. Urobilinogen
D. Stercobilinogen
E. Biliverdine

32. Bacteria entered the alveolar space of an acinus. Here they interacted with the surfactant, leading to activation of the cells localized in the alveolar walls and on the alveolar surface. Name these cells:
A. Alveolar macrophages
B. Clara cells
C. Type 1 pneumocytes
D. Type 2 pneumocytes

33. A patient with hypertension has developed headache, tinnitus, vomiting, high BP up to 220/160 mm Hg. On examination: facial asymmetry on the right, volitional mobility is absent, increased tendon reflexes and muscle tone of extremities on the right. What motor disorder of the nervous system occurred in this case?

A. Hemiplegia
B. Paraplegia
C. Tetraplegia
D. Hyperkinesis
E. Monoplegia

34. A man complains that at a mention of past tragic events in his life he develops tachycardia, shortness of breath, and a sharp increase in blood pressure. What structures of the central nervous system enable such cardio-respiratory responses?
A. Cerebral cortex
B. Thalamus
C. Midbrain
D. Cerebellum
E. Hypothalamus

35. An electron micrograph of the red bone marrow shows a megakaryocyte. Its peripheral part of the cytoplasm permeated by demarcation channels. What is the role of these structures?
A. Platelet separation
B. Erythrocyte separation
C. Erythrocyte and leukocyte separation
D. Neutrophilic separation
E. Leukocyte separation

36. The process of tissue respiration is accompanied by oxidation of organic compounds and synthesis of macroergic molecules. In what organelles does this process occur?
A. Mitochondria
B. Golgi apparatus
C. Ribosomes
D. Lysosomes
E. Peroxisomes

37. People, who live in mountainous areas, have an increased erythrocyte count in blood, which may be caused by an increase in production of the following in the kidneys:

A. Erythropoietin
B. Urokinase
C. Prostaglandine
D. Renin
E. Vitamin D3

38. As a result of the injury, the spinal cord of a person was damaged with its complete rupture at the level of the first cervical vertebra. How will the breathing of the patient change?

A. Breathing will stop
B. Breathing remain unchanged
C. Breathing death will increase
D. Respiratory rate will decrease
E. Respiratory rate will increase

39. After a hypertensive crisis, a man has lost voluntary movements in his right arm and leg. The muscle tone in these limbs is increased. What type of disorder of the nervous system's motor function can be observed in this case?

A. Central paralysis
B. Central paresis
C. Peripheral paresis
D. Peripheral paralysis
E. Reflux paresis

40. A man was admitted to the trauma department with an injury on the anterior surface of his left thigh in its lower third. Examination shows a wound 1.5×3 cm in size, located transversely to the thigh, 2 cm above the patella. In the wound, the damaged tendon is well defined. Leg extension is limited in the patient. What muscle is most likely to be functionally impaired?

A. *M. quadriceps femoris*
B. *M. triceps surae*
C. *M. tibialis anterior*
D. *M. peroneus longus*
E. *M. extensor digitorum longus*

**Exercise 3. Translate the word combinations into Ukrainian.**

The distal convoluted tubule, blood flow disturbance in the classical hepatic lobules, loss of trabecular architecture in the metaphysis of right tibia, disrupted patency of the airways, constriction of the resistance vessels, stage of blood clotting, differentiate into plasma cells, sodium and water retention, disturbed protein metabolism and intensified protein putrefaction, marked muscle rigidity, an isolated squid giant axon; a disturbed speech perception, permeated by demarcation channels, impaired vision of close objects, lacrimation disorder, distended renal pelvic lumen, intestinal peristalsis.

**Exercise 4. Find synonyms of the following words in the tests:**

| | | | |
|---|---|---|---|
| distinct | | colorless | |
| primary | | unfilled | |
| impair | | sight | |
| distended | | quantity | |
| coagulation | | streak | |

**Exercise 5. Fill the table with the missing parts of speech:**

| Verb | Noun | Adjective |
|---|---|---|
| | | productive |
| | impairment | |
| | | inclusive |
| apply | | |
| | | dangerous |
| | | large |
| respond | | |
| locate | | |
| | disruption | |

**Exercise 6. Match the words with their explanations:**

| *Accident, aspirin, recover, wound, emergency, operation, bandage, fever, medicine* |
|---|

1. The acetylated derivative of salicylic acid; used as an analgesic anti-inflammatory drug usually taken in tablet form; used as an antipyretic; slows clotting of the blood by poisoning platelets.
2. A piece of soft material that covers and protects an injured part of the body.
3. An unfortunate mishap; especially one causing damage or injury.
4. A sudden unforeseen crisis (usually involving danger) that requires immediate action.
5. A rise in the temperature of the body; frequently a symptom of infection.
6. Something that treats or prevents or alleviates the symptoms of disease.
7. A medical procedure involving an incision with instruments; performed to repair damage or arrest disease in a living body.
8. Get over an illness or shock.
9. An injury to living tissue (especially an injury involving a cut or break in the skin).

**Exercise 7. Fill in the gaps with the appropriate words given in the box:**

| *Pons and cerebellum, cerebral cortex, composed, independent, entity, environment, existence, internal, permeability, substances, property, impermeable, permeable, membrane* |
|---|

The human body is (1)_____ of the various body systems structurally and functionally linked together as an (2) _____. Every system in the body is (3) _____ structurally and functionally yet, all the systems are interdependent. Existence of an organism is impossible without the presence of an (4) _____ sustaining it. That is why it is reasonable to speak about (5) _____ of two environments: the internal environment of the human body and the (6) _____ environment of human body.

Transport process depends on the (7) _____ of the cell membrane that determines precisely which (8) _____ can enter or leave the cyto-

plasm. That (9) _____ of the cell membrane is called permeability. A membrane through which nothing can pass is described as (10) _____. A membrane through which any substance can pass without difficulty is *freely* (11) _____. A *selectively permeable* (12) _____ permits the free passage of some materials and restricts the passage of others. Most of the actual information processing in the brain takes place (13) in the _____. The hindbrain extends from the spinal cord and contains (14) the _____.

**Exercise 8. Give definitions below to the terms in the box:**

| Tendon | Cardiac muscle | Smooth muscle | Ligament |
|---|---|---|---|
| Neuromuscular junction | Aponeuroses | Myofibril | Myosin |

1. A specialized form of striated muscle occurring in the hearts of vertebrates.

2. Involuntary muscle tissue in the walls of viscera and blood vessels, consisting of nonstriated, spindle-shaped cells.

3. A cord or band of dense, tough, inelastic, white, fibrous tissue, serving to connect a muscle with a bone or part.

4. A band of tissue, usually white and fibrous, serving to connect bones, hold organs in place.

5. A synapse between a motor neuron and skeletal muscle.

6. A sheet of pearly-white fibrous tissue that takes the place of a tendon in sheet-like muscles having a wide area of attachment.

7. Any of the elongated contractile threads found in striated muscle cells.

8. A fibrous protein that forms the contractile filaments of muscle cells and is also involved in motion in other types of cells.

**Exercise 9. Explain the medical terms analysing the word-building elements.**

Thyroidectomy — Thyrotomy — Thyroiditis — Hypothyroidism — Hyperthyroidism

**Exercise 10. Underline the most appropriate adverb in these sentences. Decide whether the statements are likely to be said by a patient or a health professional.**

1. The fainting? It just happened ***abruptly / gradually /slowly***. The next thing I knew she was lying completely flat on the pavement.

2. The patient suddenly became pale and started to sweat, but not ***profusely / rapidly / enormously***.

3. After the attack, Mr. Jones came to ***rapidly / slowly / leisurely***, which questions whether it was a seizure.

4. ***Embarrassingly / Gradually / Clearly***, I soiled myself and wet myself. It wasn't very pleasant.

5. She was lying flat, but bystanders were trying to keep her upright, so she was twitching ***slowly / convulsively / suddenly***.

6. As he couldn't see ***good / clearly / visually***, he got quite frightened.

7. In a seizure, there is ***typically / rarely / seldom*** no prodrome, but this is not always the case.

8. After collapsing, he didn't get better ***spontaneously /slowly / gradually***. The patient was a bit drowsy for quite a while afterwards.

9. He recovered ***completely / partially / poorly*** from the accident. Now he's perfectly OK.

10. Fainting and vomiting don't ***reliably / partially /clearly*** discriminate seizures from faints.

**Exercise 11. Use the verbs in brackets in the correct form.**

1) My mother is making a steady recovery from the flu and _____ (leave) hospital by next week.

2) The neutral mutation rate is known _____ (vary) widely along human chromosomes, _____ (lead) to mutational hot and cold regions.

3) Physics, as it _____ (know) at the end of the nineteenth century, _____ (refer) to classical physics.

4) Although every philosopher since Plato _____ (consider) the relationship between humour and laughter, Freud _____ (be) the first person to put forward a conclusive theory.

5) If there _____ (be) any delay in getting her to hospital, the consequence of the event _____ (be) fatal.

6) The use of preservatives in food manufacturing _____ (rise) steadily over the past few decades and _____ (show) no signs of abating.

7) Provided that he _____ (take) reasonable care of himself, the old man has every chance of _____ (have) a complete recovery.

8) The doctors are of the opinion that if the disorder _____ (diagnose) a few months earlier, it _____ (treat) successfully.

9) If Julie _____ (not, starve) herself like that while we were away, she _____ (not, suffer) from anorexia nervosa today.

**Exercise 12. Translate the sentences into English.**

1. При визначенні повітряної та кісткової провідності звуку було встановлено, що у пацієнта ліве вухо краще сприймає звук при кістковій провідності.

2. В експерименті подразнюють гілочки симпатичного нерва, які іннервують серце, що призводить до збільшення сили серцевих скорочень.

3. Після черепно-мозкової травми хворий не здатний впізнавати предмети на дотик.

4. В експерименті на тварині перерозтягненням передсердь кров'ю викликали зменшення реабсорбції $Na^+$ і води в ниркових канальцях.

5. Експериментальне руйнування супраоптичних ядер гіпоталамуса у тварин викликає значне збільшення добового діурезу.

6. З метою схуднення жінка обмежувала кількість продуктів у харчовому раціоні. Через 3 місяці в неї з'явилися набряки, збільшився діурез.

7. Внаслідок фізичного навантаження киснева ємність крові в людини збільшилася з 180 до 200 мл/л.

8. У людини внаслідок хронічного захворювання печінки суттєво порушена функція синтезу білка.

9. Внаслідок тривалого перебування людини у горах на висоті 3000 м над рівнем моря у неї збільшилась киснева ємність крові.

10. Аутопсія мозку виявила набряк, гіперемію та невеликі крововиливи в довгастий мозок.

# *UNIT 5*
# BIOCHEMISTRY

## Chapter I

**Exercise 1. Key words.**

| Noun | Verb | Adjective | Adverb |
|---|---|---|---|
| bowel | conclude | capable | eccentrically |
| disintegration | decrease | colourless | extremely |
| deviation | excrete | competitive | insufficiently |
| dizziness | inherit | durative | richly |
| indication | inhibit | frequent | |
| interrogation | intensify | instantaneous | |
| lapse | intend | intensified | |
| maintenance | maintain | lenticular | |
| necropsy | obstruct | probable | |
| putrefaction | prove | slight | |
| starvation | witness | spotty | |
| | | strengthened | |
| | | susceptible | |

**Exercise 2. Read the tests.**

1. Pain along large nervous stems and increased amount of pyruvate in the blood were revealed in the patient. Insufficiency of what vitamin insufficiency can cause such change?

A. B1
B. B2
C. PP
D. Pantothenic acid
E. Biotin

2. In case of enterobiasis acrihine, the structural analogue of vitamin B2, is administered. The synthesis disorder of which enzymes does this medicine cause in microorganisms?

A. FAD-dependent dehydrogenases
B. Cytochromeoxidases
C. Peptidases
D. NAD-dependent dehydrogenases
E. Aminotransferases

3. A 10-year-old girl often experiences acute respiratory infections with multiple spotty haemorrages in the places of clothes friction. Hypovitaminosis of what vitamin is present at the girl?

A. C
B. B6
C. B1
D. A
E. B2

4. There is observed inhibited fibrillation in the patients with bile ducts obstruction, bleeding due to low level of absorption of some vitamins. What vitamin is in deficit?

A. K
B. A
C. D
D. E
E. Carotene

5. During endotoxemia active forms of the oxygen including superoxide anion radical are formed in the human body. With help of what enzyme is this anion activated?

A. Superoxide dismutase
B. Catalase
C. Peroxidase
D. Glutathioneperoxidase
E. Glutathionereductase

6. A patient presents high activity of LDH1 and LDH2, aspartate aminotransferase, and creatine phosphokinase. In what organ (organs) is the development of a pathological process the most probable?

A. In the heart muscle (initial stage of myocardial infarction)

B. In skeletal muscles (dystrophy, atrophy)
C. In kidneys and adrenals
D. In connective tissue
E. In liver and kidneys

7. While examining the child the doctor revealed symmetric cheeks roughness, diarrhea, dysfunction of the nervous system. Lack of what food components caused it?
A. Nicotinic acid, tryptophane
B. Lysine, ascorbic acid
C. Threonine, pantothenic acid
D. Methionine, lipoic acid
E. Phenylalanine, pangamic acid

8. A 13-year-old boy complains of general weakness, dizziness, tiredness. He is mentally retarded. Increased level of valine, isoleucine, leucine is in the blood and urine. Urine has a specific smell. What is the diagnosis?
A. Maple syrup urine disease
B. Addison's disease
C. Tyrosinosis
D. Histidinemia
E. Graves' disease

9. Aspirin has an anti-inflammatory effect due to inhibition of the cyclooxygenase activity. What biological active acids level will decrease?
A. Prostaglandins
B. Leukotriens
C. Catecholamines
D. Biogenic amines
E. Iodinethyronyns

10. Examination of a patient revealed typical presentations of collagenosis. This pathology is characterized by increase of the following urine index:
A. Hydroxyproline
B. Arginine
C. Glucose
D. Mineral salts
E. Ammonium salts

11. Marked increase of activity of MB-forms of CPK (creatine phosphokinase) and LDH1 were revealed on the examination of the patient's blood. What is the most likely pathology?

A. Myocardial infarction
B. Hepatitis
C. Rheumatism
D. Pancreatitis
E. Cholecystitis

12. A patient has an increased pyruvate concentration in blood. A large amount of it is excreted with the urine. What vitamin is lacking in this patient?

A. B1
B. E
C. B3
D. B6
E. B2

13. 12 hours after an acute attack of retrosternal pain a patient presented a jump of aspartate aminotransferase activity in blood serum. What pathology is this deviation typical for?

A. Myocardium infarction
B. Viral hepatitis
C. Collagenosis
D. Diabetes mellitus
E. Diabetes insipidus

14. A woman who has been keeping to a clean-rice diet for a long time was diagnosed with polyneuritis (beriberi). What vitamin deficiency results in development of this disease?

A. Thiamine
B. Ascorbic acid
C. Pyridoxine
D. Folic acid
E. Riboflavin

15. Examination of a patient with frequent hemorrhages from internals and mucous membranes revealed proline and lysine being a part of colla-

gen fibers. What vitamin absence caused disturbance of their hydroxylation?

A. Vitamin C
B. Vitamin K
C. Vitamin A
D. Thiamine
E. Vitamin E

16. To prevent postoperative bleeding a 6 y/o child was administered vicasol that is a synthetic analogue of vitamin K. Name post-translational changes of blood coagulation factors that will be activated by vicasol:

A. Carboxylation of glutamic acid
B. Phosphorylation of serine radicals
C. Partial proteolysis
D. Polymerization
E. Glycosylation

17. According to clinical indications a patient was administered pyridoxal phosphate. What processes is this medication intended to correct?

A. Transamination and decarboxylation of aminoacids
B. Oxidative decarboxylation of ketoacids
C. Desamination of purine nucleotide
D. Synthesis of purine and pyrimidine bases
E. Protein synthesis

18. As a result of posttranslational modifications some proteins taking part in blood coagulation, particularly prothrombin, become capable of calcium binding. The following vitamin takes part in this process:

A. K
B. C
C. A
D. B1
E. B2

19. A 3-year-old child with symptoms of stomatitis, gingivitis and dermatitis of open skin areas was delivered to a hospital. Examination revealed inherited disturbance of neutral amino acid transporting in the bowels. These symptoms were caused by the deficiency of the following vitamin:

A. Niacin

B. Pantothenic acid
C. Vitamin A
D. Cobalamin
E. Biotin

20. Surgical removal of a part of the stomach resulted in disturbed absorption of vitamin B12, it is excreted with feces. The patient was diagnosed with anemia. What factor is necessary for absorption of this vitamin?
A. Gastromucoprotein
B. Gastrin
C. Hydrochloric acid
D. Pepsin
E. Folic acid

21. A patient was diagnosed with megaloblastic anemia. Which substance lack in the human organism can cause this disease?
A. Copper
B. Glycine
C. Cobalamin
D. Cholecalciferol
E. Magnesium

22. There is an increase of the pyruvate level in the patient's blood and urine. What kind of avitaminosis developed in this case?
A. B1 avitaminosis
B. E avitaminosis
C. B3 avitaminosis
D. B6 avitaminosis
E. B2 avitaminosis

23. The living organisms that did develop the system of defense against the unfavorable action of $H_2O_2$ during the evolution can exist only in anaerobic conditions. Which of the enzymes can destroy hydrogen peroxide?
A. Peroxidase and catalase.
B. Oxygenases and hydroxylases
C. Cytochrome oxidase, cytochrome b
D. Oxygenase and catalase
E. Flavin-linked oxidases

24. During the necropsy of a 20-year old girl a pathologist concluded that the death of the patient had resulted from poisoning by cyanides. What enzyme activity is mostly inhibited by cyanides?

A. Cytochrome oxidase
B. Malate dehydrogenase
C. Heme synthase
D. Aspartate aminotransferase
E. Carbamoyl phosphate synthetase

25. Potassium cyanide is a very dangerous poison that causes instantaneous death of a human organism. What mitochondrial enzyme is affected by potassium cyanide?

A. Cytochrome oxidase (cytochrome aa3)
B. Flavine enzymes
C. Cytochrome b
D. NAD+-dependent dehydrogenases
E. Cytochrome P450

26. Patient with encephalopathy was admitted to the neurological inpatient department. Correlation of the increase of encephalopathy and substances absorbed by the bloodstream from the intestines was revealed. What substances that are created in the intestines can cause endotoxemia?

A. Indole
B. Butyrate
C. Acetoacetate
D. Biotin
E. Ornithine

27. Examination of a patient suffering from cancer of the urinary bladder revealed a high rate of serotonin and hydroxyanthranilic acid. It is caused by excess of the following amino acid in the organism:

A. Tryptophan
B. Alanine
C. Histidine
D. Methionine
E. Tyrosine

28. A 4 y. o. child with signs of durative protein starvation was admitted to the hospital. The signs were as follows: growth inhibition, anemia, edema, mental deficiency. Choose a cause of edema development:

A. Reduced synthesis of albumins
B. Reduced synthesis of globulins
C. Reduced synthesis of hemoglobin
D. Reduced synthesis of lipoproteins
E. Reduced synthesis of glycoproteins

29. The concentration of albumins in a human blood sample is lower than normal. This leads to edema of tissues. What blood function is damaged?

A. Maintaining the oncotic blood pressure
B. Maintaining the Ph level
C. Maintaining the body temperature
D. Maintaining the blood sedimentation system
E. All answers are correct

30. Ammonia is a very toxic substance, especially for the nervous system. What substance takes the most active part in ammonia detoxification in brain tissues?

A. Glutamic acid
B. Lysine
C. Proline
D. Histidine
E. Alanine

31. A patient has pellagra. Interrogation revealed that he had lived mostly on maize for a long time and eaten little meat. This disease had been caused by the deficit of the following substance in the maize:

A. Tryptophan
B. Tyrosine
C. Proline
D. Alanine
E. Histidine

32. A patient with serious damage of muscular tissue was admitted to the traumatological department. What biochemical urine index will be increased in this case?

A. Creatinine

B. Common lipids
C. Glucose
D. Mineral salts
E. Uric acid

33. Nappies of a newborn have dark spots being the evidence of homogentisic acid formation. This is caused by the metabolic disorder of the following substance:
A. Tyrosine
B. Galactose
C. Methionine
D. Cholesterol
E. Tryptophan

34. A 1.5-year-old child presents with both mental and physical lag, discoloration of skin and hair, decrease in catecholamine concentration in blood. When a few drops of 5% solution of trichloroacetic iron were added to the child's urine it turned olive green. Such alterations are typical for the following pathology of the amino acid metabolism:
A. Phenylketonuria
B. Alkaptonuria
C. Tyrosinosis
D. Albinism
E. Xanthinuria

35. The greater amount of nitrogen is excreted from the organism in the form of urea. Inhibition of urea synthesis and accumulation of ammonia in blood and tissues are induced by the decreased activity of the following liver enzyme:
A. Carbamoyl phosphate synthetase
B. Aspartate aminotransferase
C. Urease
D. Amylase
E. Pepsin

36. After a serious viral infection a 3-year-old child has repeated vomiting, loss of consciousness, convulsions. Examination revealed hyperammonemia. What may have caused changes of biochemical blood indices of this child?
A. Disorder of ammonia neutralization in ornithin cycle

B. Activated processes of amino acids decarboxylation
C. Disorder of biogenic amines neutralization
D. Increased putrefaction of proteins in intestines
E. Inhibited activity of transamination enzymes

37. Albinos can't stand sun impact — they don't acquire sun-tan but get sunburns. Disturbed metabolism of what amino acid underlies this phenomenon?
A. Phenylalanine
B. Methionine
C. Tryptophan
D. Glutamic acid
E. Histidine

38. Glutamate decarboxylation results in formation of an inhibitory transmitter in CNS. Name it:
A. GABA
B. Glutathione
C. Histamine
D. Serotonin
E. Asparagine

39. In the course of histidine catabolism a biogenic amine is formed that has a powerful vasodilating effect. Name it:
A. Histamine
B. Serotonin
C. Dioxyphenylalanine
D. Noradrenalin
E. Dopamine

40. A patient diagnosed with carcinoid of bowels was admitted to the hospital. Analysis revealed high production of serotonin. It is known that this substance is formed of tryptophan aminoacid. What biochemical mechanism underlies this process?
A. Decarboxylation
B. Desamination
C. Microsomal oxidation
D. Transamination
E. Formation of paired compounds

**Exercise 3. Translate the word-combinations from English into Ukrainian.**

Intensified disintegration, increased susceptibility, physical lag, calculi formation, amount of nitrogen, sun impact, probable cause, instantaneous death, vasodilating effect, lapse of time, maple syrup, mentally retarded, participation of vitamin, lenticular opacity, epileptic seizure, potassium cyanide, target cell, change of gene expression, fungi toxins, restore native structure, dizziness and memory impairment.

**Exercise 4. Find synonyms in the tests to the following words and word combinations.**

Avitaminosis, deficiency of the substances, next enzymes, immediate death, cataract, high concentration, physical delay, vertigo, intensified breakdown, quantity of compounds, insufficiency of time, involvement of vitamins, stone formation, attack.

**Exercise 5. Remember roots and suffixes pertaining to biochemistry.**

| Root/Suffix | Meaning | Example |
|---|---|---|
| cyto- | cell | cytology |
| lipo- | fat | adipocellular |
| glyco- | sugar | glycolipid, glucose |
| iso- | equal, similar | isoenzyme |
| poli- | multiple | polysaccharides |
| -ine | relating to, made of | glycine, lysine |
| -lysis | decomposition, breaking down | glycolysis, electrolysis |
| -cyte | cell | erythrocyte |

**Exercise 6. Translate sentences from Ukrainian into English.**

1. Ціанід калію — дуже небезпечна отрута, яка спричиняє миттєву смерть організму людини.

2. Під час тесту на гіперчутливість пацієнтці ввели підшкірну ін'єкцію антигену, що спричинило почервоніння шкіри, набряки, біль внаслідок дії гістаміну.

3. Найбільш імовірною причиною утворення каменів є посилена концентрація сечової кислоти.

4. З плином часу клітини-мішені пухлини втратили сприйнятливість до цього препарату.

5. Підгузки новонародженого мають темні плями, які свідчать про утворення гомогентизинової кислоти.

6. Психічно відсталий хлопчик скаржиться на загальну слабкість, запаморочення, втому.

7. В результаті модифікацій деякі білки, що беруть участь у згортанні крові, стають здатними до зв'язування кальцію.

8. У 10-річної дівчинки часто виникають ГРВІ з численними плямистими крововиливами в місцях тертя одягу.

9. Аміак — дуже токсична речовина, особливо для нервової системи.

10. У хворого жовтий колір шкіри, темна сеча, ахроматичний кал.

**Exercise 7. Match terms with definitions**

| | |
|---|---|
| Diabetes mellitus | A. Extremely lethargic or sleepy. |
| Uneventful | B. The chemical processes that occur within a living organism in order to maintain life. |
| Comatose | C. A hormone produced in the pancreas by the islets of Langerhans, which regulates the amount of glucose in the blood. The lack of insulin causes a form of diabetes. |
| Oxidation | D. Be developing an infectious disease before symptoms appear. |
| Insulin | E. A disease of inadequate control of blood levels of glucose. |
| Protein | F. A molecule that contains two or more amino acids (the molecules that join together to form proteins). |
| Metabolism | G. A chemical reaction that takes place when a substance comes into contact with oxygen or another oxidizing substance. |
| Incubating | H. Any of a class of nitrogenous organic compounds that have large molecules composed of one or more long chains of amino acids and are an essential part of all living organisms, especially as structural components of body tissues such as muscle, hair, etc., and as enzymes and antibodies. |
| Peptide | I. Not marked by interesting or exciting events. |

**Exercise 8. Fill in the gaps.**

| Diabetes mellitus, uneventful, comatose, oxidation, insulin, protein, metabolism, incubating, peptide |
|---|

The patient is a 5-year-old boy, who was born in 1967, at term, after an ____ pregnancy. He was a sickly infant, and did not grow well. On a number of occasions his mother noted that he appeared drowsy, or even _____, and said that there was a "chemical, alcohol-like" smell on his breath, and in his urine. The GP suspected _____, and sent him to the Middlesex Hospital in London for a glucose tolerance test.

Blood samples were also taken for measurement of insulin at zero time and 1 hour after the glucose load. At this time a new method of measuring _____ was being developed, radioimmunoassay, and therefore both this and the conventional biological assay were used. The biological method of measuring insulin is by its ability to stimulate the uptake and _____ of glucose in rat muscle in vitro; this can be performed relatively simply by measuring the radioactivity in $CO_2$ after ____ duplicate samples of the muscle with glucose, with and without the sample containing insulin.

As a part of their studies of the new radioimmunoassay for insulin, the team at the Middlesex Hospital performed gel exclusion chromatography of a pooled sample of normal serum, and determined insulin in the fractions eluted from the columns both by radioimmunoassay and by stimulation of glucose _____ . Three molecular mass markers were used; they eluted as follows: Mr 9000 in fraction 10, Mr 6000 in fraction 23, and Mr 4500 in fraction 27.

Since these studies in the 1960s, the gene for human insulin has been cloned. Although insulin consists of two_____ chains, 21 and 30 amino acids long, respectively, these are coded for by a single gene, which has a total of 330 base pairs between the initiator and stop codons. As you would expect for a secreted _____, there is a signal sequence coding for 24 amino acids at the 5′ end of the gene.

**Exercise 9. Read, translate and give definitions to the terms.**

The patient is a 28-week-old baby girl. She was admitted to the **emergency department** in a **coma**, having suffered a **convulsion** after feeding. She had a mild infection and slight **fever** at the time. Since birth she had been a sickly child, and had frequently vomited and become **drowsy** after feeding. She was bottle-fed and at one time cows' milk allergy was suspected, although the problems persisted when she was fed on soya-milk.

On admission she was mildly **hypoglycemic**, ketotic and her plasma pH was 7.29. Analysis of a blood sample showed normal levels of insulin, but considerable hyperammonemia (plasma ammonium ion concentration 500 μmol/L; reference range 40–80 μmol/L). She responded well to intravenous glucose infusion and rectal infusion of lactulose, regaining consciousness. She had poor muscle tone.

A liver biopsy sample was taken, and the activities of the **enzymes** of urea synthesis were determined, and compared with activities in postmortem liver samples from six infants of the same age. She remained well on a high carbohydrate, low protein diet for several days, although the poor muscle tone and muscle weakness persisted. A second liver **biopsy** sample was taken after 4 days and the activity of the enzymes determined again.

**Exercise 10. Read, translate and discuss a preliminary diagnosis. What analysis you may need to make a correct diagnosis?**

The patient is a 10-year-old Maltese boy. On his birthday his aunt gave him a pie made from fava beans (a local delicacy), and that evening he suffered kidney pain, and passed dark urine. A blood film showed a low red blood cell count and the plasma was red colored. This problem is not uncommon in Malta, and indeed several of his classmates (all boys) have died when an acute crisis has been precipitated by eating fava beans, or after a moderate fever associated with an infection.

Further studies showed that his erythrocyte glucose 6-phosphate dehydrogenase was only 10% of normal and had a very high Km for NADP+. Unlike the patient in case 3, his red blood cell enzyme was as stable to incubation at 45°C as that from control subjects.

**Exercise 11. Define each of the following abbreviations:**

| | |
|---|---|
| ACTH | |
| ROS | |
| MAP | |
| STP | |
| IF | |
| PHC | |
| HRE | |
| GPI | |
| sER | |
| DAG | |
| cDNA | |
| ig | |

# Chapter II

**Exercise 1. Key words.**

| Noun | Verb | Adjective | Adverb |
|---|---|---|---|
| assumption | accelerate | abrupt | approximately |
| aversion | confirm | additive | congenitally |
| buffer | consume | apparent | immediately |
| bile | curdle | cellular | respectively |
| display | delay | congenital | |
| insanity | enhance | essential | |
| involvement | exhaust | flaccid | |
| sluggishness | feed | improper | |
| quantity | investigate | nursing | |
| | perform | plentiful | |
| | secrete | provisional | |
| | suggest | | |

**Exercise 2. Read and translate the tests.**

1. An infant has apparent diarrhea resulting from improper feeding. One of the main diarrhea effects is plentiful excretion of sodium bicarbonate. What form of acid-base balance disorder is the case?

A. Metabolic acidosis
B. Metabolic alkalosis
C. Respiratory acidosis
D. Respiratory alkalosis
E. No disorders of acid-base balance will be observed

2. Buffer capacity of blood was decreased in the worker due to exhausting muscular work. Entry of what acid substance to the blood can this state be explained?

A. Lactate
B. Pyruvate
C. 1,3-bisphosphoglycerate
D. alpha-ketoglutarate
E. 3-phosphoglycerate

3. A 38-year-old patient suffers from rheumatism in its active phase. What laboratory characteristic of blood serum is of diagnostic importance in case of this pathology?

A. C-reactive protein
B. Uric acid
C. Urea
D. Creatinine
E. Transferrin

4. A 30 y/o woman had been ill for a year when she felt pain in the area of joints for the first time, they got swollen and skin above them became reddened. Provisional diagnosis is rheumatoid arthritis. One of the most probable causes of this disease is a structure alteration of a connective tissue protein:

A. Collagen
B. Mucin
C. Myosin
D. Ovoalbumin
E. Troponin

5. A 7-year-old girl has signs of anemia. Laboratory examination revealed pyruvate kinase deficiency in erythrocytes. What process disturbance plays the main role in anemia development?

A. Anaerobic glycolysis
B. Oxidative phosphorylation
C. Tissue respiration
D. Peroxide decomposition
E. Aminoacids desamination

6. A patient complains about dyspnea provoked by the physical activity. Clinical examination revealed anaemia and presence of the paraprotein in the zone of gamma-globulins. To confirm the myeloma diagnosis, it is necessary to determine the following index in the patient's urine:

A. Bence-Jones protein
B. Bilirubin
C. Haemoglobin
D. Ceruloplasmin
E. Antitrypsin

7. A 62 y/o woman complains of frequent pains in the area of her chest and backbone, rib fractures. A doctor assumed myelomatosis (plasmacytoma). What of the following laboratory characteristics will be of the greatest diagnostic importance?

A. Paraproteinemia
B. Hyperalbuminemia
C. Proteinuria
D. Hypoglobulinemia
E. Hypoproteinemia

8. Pathological changes of the liver and brain were revealed in a 27-year-old patient. The copper concentration is abruptly decreased in blood plasma and increased in the urine. Wilson's disease was diagnosed. Activity of what enzyme in the blood serum should be examined to prove diagnosis?

A. Ceruloplasmin
B. Carboanhydrase
C. Xanthine oxidase
D. Leucinamineopeptidase
E. Alcoholdehydrogenase

9. A 50-year-old patient complains about general weakness, appetite loss and cardiac arrhythmia. The patient presents with muscle hypotonia, flaccid paralysis, weakened peristaltic activity of the bowels. Such condition might be caused by:

A. Hypopotassemia
B. Hypoproteinemia
C. Hyperkalemia
D. Hypophosphatemia
E. Hyponatremia

10. A 63-year-old woman developed signs of rheumatoid arthritis. Increase of which indicated blood values level could be helpful in proving diagnosis?

A. Additive glycosaminoglycans
B. Lipoproteids
C. Acid phosphatase
D. General cholesterol
E. R-glycosidase

11. A 35 y/o patient who often consumes alcohol was treated with diuretics. There appeared serious muscle and heart weakness, vomiting, diarrhea, AP — 100/60 mm Hg, depression. This condition is caused by intensified excretion with urine of:

A. Potassium
B. Sodium
C. Chlorine
D. Calcium
E. Phosphates

12. A patient suffers from hepatic cirrhosis. Examination of which of the following substances excreted by urine can characterize the state of antitoxic function of the liver?

A. Hippuric acid
B. Ammonium salts
C. Creatinine
D. Uric acid
E. Aminoacids

13. Products of some proteins hydrolysis and modification are the biologically active substances called hormones. Lipotropin, corticotropin, melanotropin and endorphins are synthesized in the hypophysis of the following protein:

A. Proopiomelanocortin (POMC)
B. Neuroalbumin
C. Neurostromin
D. Neuroglobin
E. Thyreoglobulin

14. During examination of an 11-month-old infant a pediatrician revealed osteoectasia of the lower extremities and delayed mineralization of cranial bones. Such pathology is usually provoked by the deficit of the following vitamin:

A. Cholecalciferol
B. Thiamin
C. Pantothenic acid
D. Bioflavonoids
E. Riboflavin

15. Disulfiram is widely used in medical practice to prevent alcoholism. It inhibits aldehyde dehydrogenase. Increased level of what metabolite causes aversion to alcohol?

A. Acetaldehyde
B. Ethanol
C. Malonyl aldehyde
D. Propionic aldehyde
E. Methanol

16. Index of pH of the blood changed and became 7.3 in the patient with diabetes mellitus. Detecting the components of what buffer system is used while diagnosing disorder of the acid base equilibrium?

A. Bicarbonate
B. Phosphate
C. Hemoglobin
D. Oxyhemoglobin
E. Protein

17. Diabetes mellitus causes ketosis as a result of activated oxidation of fatty acids. What disorders of acid-base equilibrium may be caused by excessive accumulation of ketone bodies in blood?

A. Metabolic acidosis
B. Metabolic alkalosis
C. Any changes won't happen
D. Respiratory acidosis
E. Respiratory alkalosis

18. Depressions and emotional insanities result from the deficit of noradrenalin, serotonin and other biogenic amines in the brain. Their concentration in the synapses can be increased by means of the antidepressants that inhibit the following enzyme:

A. Monoamine oxidase
B. Diamine oxidase
C. L-amino-acid oxidase
D. D-amino-acid oxidase
E. Phenylalanine-4-monooxygenase

19. A patient with suspected diagnosis “progressing muscular dystrophy” got his urine tested. What compound will confirm this diagnosis if found in urine?

A. Creatine
B. Collagen
C. Porphyrin
D. Myoglobin
E. Calmodulin

20. Dietary intake of a 30-year-old nursing woman contains 1000 mg of calcium, 1300 mg of phosphorus and 20 mg of iron per day. It is necessary to change content of these mineral substances in the following way:

A. To increase phosphorus content
B. To increase calcium content
C. To reduce fluorine content
D. To increase iron content
E. To reduce iron content

21. Cardinal symptoms of primary hyperparathyroidism are osteoporosis and renal lesion along with development of urolithiasis. What substance makes up the basis of these calculi in this disease?

A. Calcium phosphate
B. Uric acid
C. Cystine
D. Bilirubin
E. Cholesterol

22. Study of conversion of a food colouring agent revealed that neutralization of this xenobiotic takes place only in one phase — microsomal oxidation. Name a component of this phase:

A. Cytochrome P-450
B. Cytochrome B
C. Cytochrome C
D. Cytochrome A
E. Cytochrome oxidase

23. A patient had a hemorrhagic stroke. Blood examination revealed strengthened kinin concentration. The patient was prescribed Contrical. It was administered in order to inhibit the following proteinase:

A. Kallikrein
B. Pepsin
C. Trypsin
D. Chemotrypsin
E. Collagenase

24. Under different pathological states the level of active forms of oxygen rises, which results in the destruction of cellular membranes. In order to prevent the damage of membranes, antioxidants are used. The most powerful natural antioxidant is:
A. α-Tocopherol
B. Glucose
C. Vitamin A
D. Fatty acids
E. Glycerol

25. A 4-year-old child with hereditary renal lesion has signs of rickets, vitamin D concentration in blood is normal. What is the most probable cause of rickets development?
A. Impaired synthesis of calcitriol
B. Increased excretion of calcium
C. Hyperfunction of parathyroid glands
D. Hypofunction of parathyroid glands
E. Lack of calcium in food

26. After consumption of rich food a patient has nausea and heartburn, steatorrhea. This condition might be caused by:
A. Bile acid deficiency
B. Increased lipase secretion
C. Disturbed trypsin synthesis
D. Amylase deficiency
E. Disturbed phospholipase synthesis

27. Fatty of phospholipids is disordered due to fat infiltration of the liver. Indicate which of the presented substances can enhance the process of methylation during phospholipids synthesis?
A. Methionine
B. Ascorbic acid
C. Glucose
D. Glycerin
E. Citrate

28. Blood of the patients with diabetes mellitus shows increased content of free fatty acids. Name the most likely cause of this:

A. Increased activity of adipose triglyceride lipase

B. Storage of palmitatoyl-CoA

C. Activation of the ketone bodies utilization

D. Activation of the synthesis of the apolipoproteins

E. Decreased activity of phosphatidylcholine-cholesterol-acyltransferase blood plasma

29. A patient with a high rate of obesity was advised to use carnitine as a food additive in order to enhance "fat burning". What is the role of carnitine in the process of fat oxidation?

A. Transport of FFA (free fatty acids) from cytosol to the mitochondria

B. Transport of FFA from fat depots to the tissues

C. It takes part in one of reactions of FFA beta-oxidation

D. FFA activation

E. Activation of intracellular lipolysis

30. An experimental animal that was kept on a protein-free diet developed fatty liver infiltration, in particular as a result of deficiency of methylating agents. This is caused by disturbed generation of the following metabolite:

A. Choline

B. DOPA

C. Cholesterol

D. Acetoacetate

E. Linoleic acid

31. Carnitine including a drug was recommended to the sportsman for improving results. What process is activated most of all with help of carnitine?

A. Transport of fatty acids to the mitochondria

B. Synthesis of steroid hormones

C. Synthesis of ketone bodies

D. Synthesis of lipids

E. Tissue respiration

32. After intake of rich food a patient feels nausea and sluggishness; with time there appeared signs of steatorrhea. Blood cholesterine concentration is 9.2 micromol/l. This condition was caused by lack of:

A. Bile acids
B. Triglycerides
C. Fatty acids
D. Phospholipids
E. Chylomicrons

33. Examination of a man who hadn't been consuming fats but had been getting enough carbohydrates and proteins for a long time revealed dermatitis, poor wound healing, vision impairment. What is the probable cause of metabolic disorder?

A. Lack of linoleic acid, vitamins A, D, E, K
B. Lack of palmitic acid
C. Lack of vitamins PP, H
D. Low caloric value of diet
E. Lack of butyric acid

34. An experimental animal has been given an excessive amount of carbon-labeled glucose for a week. What compound can the label be found in?

A. Palmitic acid
B. Methionine
C. Vitamin A
D. Choline
E. Arachidonic acid

35. A sportsman was recommended to take a medication that contains carnitine in order to improve his results. What process is activated by carnitine the most?

A. Fatty acids transport to mitochondrions
B. Synthesis of steroid hormones
C. Synthesis of ketone bodies
D. Synthesis of lipids
E. Tissue respiration

36. Examination of a patient suffering from chronic hepatitis revealed a significant decrease in the synthesis and secretion of bile acids. What process will be mainly disturbed in the patient's bowels?

A. Fats emulsification
B. Protein digestion
C. Carbohydrate digestion
D. Glycerin absorption
E. Amino acid absorption

37. A 6-year-old child was delivered to a hospital. Examination revealed that the child couldn't fix his eyes, didn't keep his eyes on toys, and the eye ground had the cherry-red spot sign. Laboratory analyses showed that the brain, liver and spleen had a high rate of ganglioside glycometide. What congenital disease is the child ill with?

A. Tay-Sachs disease
B. Wilson's syndrome
C. Turner's syndrome
D. Niemann-Pick disease
E. Mc Ardle disease

38. NSAID blocks the utilization of arachidonic acid via cyclooxygenase pathway, which results in formation of some bioactive substances. Name them:

A. Prostaglandins
B. Thyroxine
C. Biogenic amines
D. Somatomedins
E. Insulin-like growth factors

39. Arachidonic acid, an essential component of a human diet, acts as a precursor of the vitally important physiologically active biomolecules. Which substances are synthesized via cyclooxygenase pathway from arachidonic acid?

A. Prostaglandins
B. Choline
C. Noradrenaline
D. Ethanolamine
E. Triiodothyronine

40. A 1-year-old child with symptoms of muscle involvement was admitted to the hospital. Examination revealed carnitine deficiency in his muscles. What process disturbance is the biochemical basis of this pathology?

A. Transporting of fatty acids to mitochondrions
B. Regulation of $Ca^{2+}$ level in mitochondrions
C. Substrate phosphorylation
D. Lactic acid utilization
E. Actin and myosin synthesis

**Exercise 3. Translate word-combinations from English into Ukrainian.**

Make the assumption, milk curdling, display a marked increase, renal lesion, plentiful excretion, nursing woman, empty stomach, tolerance to glucose, significant decrease, enhance the process, poor wound healing, vision impairment, aversion to alcohol, delayed mineralization, cranial bones, activity of the bowels, be provoked by the deficit, abruptly decreased, prove diagnosis, flaccid paralysis, weakened peristaltic, improper feeding, plentiful excretion.

**Exercise 4. Find the synonyms to the following words from the brackets. More than one is possible.**

Assumption —
Additive —
Aversion —
Display —
Enhance —
Healing —
Lesion —
Secretion —
Significant —
Quantity —

(Increase, amount, therapy, sore, excretion, care, suggestion, rejection, number, raise, supplemental, demonstrate, ulcer, treatment, considerable)

**Exercise 5.**

**a) Make nouns from given verbs with the help of suffix -ion (-tion).**

Absorb, prepare, activate, preserve, constrict, inhibit, denaturate, coagulate, irritate, agglutinate, ovulate, transfuse, indicate, concentrate, obstruct, dilate, inflame, aggravate, associate, digest.

**b) Make nouns form given adjectives with the help of suffix -(i)ty.**

Able, acid, severe, stable, proper, persistent, capable, mortal, morbid, permeable, regular, stable, sensitive, reactive, pure, susceptible, major, soluble, compatible, irreversible.

**Exercise 6. Translate the sentences from Ukrainian into English.**

1. Аналіз плазми крові виявив різке зниження концентрації міді.
2. Офтальмолог встановив, що в амбулаторного хворого спостерігається збільшення часу адаптації зору до темряви.
3. Клінічні ознаки та лабораторне дослідження пацієнта дають підстави зробити припущення про запалення жовчного міхура.
4. Після прийому збагаченої їжі пацієнт відчуває нудоту і млявість.
5. Цукровий діабет викликає кетоз внаслідок активованого окиснення жирних кислот.
6. Основними симптомами первинного гіперпаратиреозу є остеопороз та ураження нирок разом із розвитком сечокам'яної хвороби.
7. Пацієнт 50 років скаржиться на загальну слабкість, зниження апетиту та серцеву аритмію.
8. У пацієнта спостерігаються м'язова гіпотонія, мляві паралічі, ослаблена перистальтична активність кишечнику.
9. Буферна здатність крові була знижена у працівника через виснажливу м'язову роботу.
10. Концентрація міді різко знижується в плазмі крові та збільшується в сечі.

**Exercise 7. Match terms with definitions**

| | |
|---|---|
| Grizzly | Not linked |
| Unrelated | A condition in which there is too much acid in the body fluids. It is the opposite of alkalosis (a condition in which there is too much base in the body fluids) |
| Odor | A watery, typically yellowish fluid stored in the bladder and discharged through the urethra |
| Acidosis | Inspiring disgust or distaste |
| Irritable | A sudden, violent, irregular movement of the body, caused by involuntary contraction of muscles and associated especially with brain disorders such as epilepsy, the presence of certain toxins or other agents in the blood, or fever in children |
| Urine | A distinctive smell, especially an unpleasant one |
| Convulsions | Having or showing a tendency to be easily annoyed |

**Exercise 8. Fill in the gaps.**

Grizzly, Unrelated, Odor, Acidosis, Irritable, Urine, Convulsions

The patient is a 9-month-old girl, the second child of _____ parents. She was born at term after an uneventful pregnancy, weighing 3.4 kg and was breast fed, with gradual introduction of solids from 3 months of age onward. Her mother reported that, while she liked cheese, meat, and fish, she frequently became_____ and ____ after meals, and became lethargic, drowsy, and "floppy" after eating relatively large amounts of protein-rich foods. Her_____ had a curious____, described by her mother as being "cat-like," on such occasions.

At 9 months of age she was admitted to the emergency department in a coma, and suffering _____. She had been unwell for the last 3 days, with a slight fever, and for the last 12 hours had been refusing all food and drink. At this time, she weighed 8.8 kg, and her body length was 70.5 cm.

Emergency blood tests revealed moderate ___ (pH 7.25) and severe hypoglycemia (glucose <1 mmol/L); a dipstick test for plasma ketone bodies was negative. A blood sample was taken for full clinical chemistry

tests, and she was given intravenous glucose. Within a short time she recovered consciousness.

She remained in hospital for several weeks, while further tests were performed. She was generally well through this time, but became drowsy and severely hypoglycemic, and hyperventilated, if she was deprived of food for more than about 8 to 9 hours. Her muscle tone was poor, and she was very weak, with considerably less strength (eg, in pushing her arms or legs against the pediatrician's hand) than would be expected for a girl of her age.

On one occasion her blood glucose was monitored at 30-minute intervals over 3 hours from waking, without being fed. It fell from 3.4 mmol/L on waking to 1.3 mmol/L 3 hours later. She was deprived of breakfast again the next day, and again blood glucose was measured at 30-minute intervals for 3 hours during which she received an intravenous infusion of β-hydroxybutyrate (50 μmol/min/kg body weight). During the infusion of β-hydroxybutyrate her plasma glucose remained between 3.3 and 3.5 mmol/L.

**Exercise 9. Read, translate and give definitions to the terms.**

The patient is a 9-month-old boy, the second child of unrelated parents; his brother is 5 years old, fit and healthy. He was born at full term after an uneventful pregnancy, weighing 3.4 kg (the 50th centile), and developed normally until he was 6 months old, after when he showed some **retardation** of development. He also developed a fine scaly skin rash about this time, and his hair, which had been normal, became thin and **sparse.**

At 9 months of age he was admitted to the emergency department in a coma

The acidosis was treated by intravenous **infusion** of bicarbonate, and he recovered consciousness. Over the next few days he continued to show signs of acidosis (rapid respiration), and even after a meal ketone bodies were present in his urine. His plasma lactate, pyruvate, and ketone bodies remained high; plasma glucose was in the low normal range, and his plasma insulin was normal both in the fasting state and after an oral glucose load.

Urine analysis revealed the presence of significant amounts of a number of organic acids that are not normally excreted in the urine, including: Lactate, pyruvate, and alanine, Propionate, hydroxypropionate, and propi-

onyl glycine, Methylcitrate Tiglate and tiglylglycine 3-Methyl crotonate, 3-methylcrotonylglycine, and 3-hydroxyisovalerate

His skin rash and hair loss were **reminiscent** of the signs of biotin deficiency, as caused by excessive **consumption** of uncooked egg-white. However, his mother said that he did not eat raw or undercooked eggs at all, although he was fond of hard-boiled eggs and yeast extract (which are rich sources of biotin). His plasma biotin was 0.2 nmol/L (normal >0.8 nmol/L), and he excreted a significant amount of biotin in the form of biocytin (see Figure 44–17) and small biocytin-containing peptides, which are not normally detectable in urine.

He was treated with 5 mg of biotin per day. After 3 days the abnormal organic acids were no longer detectable in his urine, and his plasma lactate, pyruvate, and ketone bodies had returned to normal, although his excretion of biocytin and biocytin-containing peptides increased. At this stage he was **discharged** from hospital, with a supply of biotin tablets. After 3 weeks his skin rash began to clear, and his hair loss ceased.

**Exercise 10. Work in groups. Guess what analysis you need to make a correct diagnosis. What is your preliminary diagnosis?**

The patient is a 4-year-old girl, the only child of nonconsanguineous parents, born at term after an uneventful pregnancy. At 14 months of age she was admitted to hospital with a 1-day history of persistent vomiting, rapid shallow respiration, and dehydration. On admission, her respiration rate was 60/minute and her pulse 178/minute. She responded rapidly to intravenous bicarbonate and a single intramuscular injection of insulin.

The results of a glucose tolerance test 3 days after admission were normal, and her plasma insulin response to an oral glucose load was within the normal range. She was discharged from hospital 7 days after admission, apparently fit and well.

She was readmitted to hospital at 16, 25, 31, and 48 months of age, suffering from restlessness, unsteady gait, rapid shallow respiration, persistent vomiting, and dehydration.

**Exercise 11. Define each of the following abbreviations:**

| | |
|---|---|
| IFN | |
| CSF | |
| HDL | |
| LDL | |
| MAT | |
| STAT | |
| bp | |
| RIA | |
| rRNA | |
| TBP | |
| PL | |
| TNF | |

# *UNIT 6*
# PATHOLOGICAL ANATOMY

**Exercise 1. Key words.**

| Noun | Verb | Adjective | Adverb |
|---|---|---|---|
| congestion | communicate | bilateral | eventually |
| delivery | contain | distended | finely |
| focus | cover | dull | tightly |
| investigation | crunch | enlarged | |
| lumen | deflate | extreme | |
| margin | detect | irregular | |
| onset | diminish | marked | |
| plaque | discharge | moist | |
| rash | exacerbate | pyogenic | |
| shin | observe | smooth | |
| thigh | perforate | softened | |
| tumor | retain | suppurative | |
| tunic | reveal | ulcerative | |
| | | viscous | |

**Exercise 2. Read the tests.**

1. A 22-year-old patient was admitted to the hospital with complaints of heavy nasal breathing. During the examination of her nasal cavity the doctors found thickened mucous membrane, a lot of mucus and nodular infiltrates without erosions in the nose. The nasal rhinoscleroma was diagnosed and biopsy was taken. What typical morphological changes may be found?

A. Granulomas with Mikulicz's cells
B. Granulomas with Virchow's cells
C. Granulomas with Langhans cells
D. Granulomas with foreign body cells
E. Interstitial inflammation

2. A patient presents with acute onset of the disease: high fever and enlarged painful spleen. On the 10th day since the onset the patient developed a maculopapular rash on the abdomen. On the 21st day the patient died of peritonitis. Postmortem study of the body shows deep ulcers in the area of necrotic aggregate lymphoid follicles (Peyer's patches) in the ileum of the deceased. One of the ulcers is perforated and diffuse fibrinopurulent peritonitis is observed. What disease can be suspected in this case?

A. Typhoid fever
B. Dysentery
C. Intestinal amebiasis
D. Cholera
E. Salmonellosis

3. On autopsy a 35-year-old man the focus of carnification 5 cm in diameter enclosed in a thin capsule was revealed in the second segment of the right lung. The focus consists of a tough dry friable tissue with a dim surface. What disease are these morphological changes typical for?

A. Tuberculoma
B. Lung cancer
C. Chondroma
D. Tumorous form of silicosis
E. Postinflammatory pneumosclerosis

4. An autopsy of a 42-year-old man, who suffered from chronic diffuse bronchitis and died of cardiopulmonary failure, shows large hyperinflated lungs that cover mediastinum with their edges. The lungs do not deflate, are colored pale grey, crunch on section; lung surface does not straighten out when pressed with a finger, resulting in a permanent depression. Mucopurulent exudate is produced from the bronchial lumen. What is the most likely diagnosis?

A. Chronic diffuse obstructive emphysema
B. Chronic focal emphysema
C. Interstitial emphysema
D. Primary idiopathic emphysema
E. Vicarious compensatory emphysema

5. Autopsy of a man with tuberculosis has revealed a 3x2 cm large cavity in the superior lobe of the right lung. The cavity was communicating with a bronchus, its wall was dense and consisted of three layers:

the internal layer was pyogenic, the middle layer was made of tuberculous granulation tissue, and the external one was made of connective tissue. What is the most likely diagnosis?

A. Fibrous cavernous tuberculosis
B. Fibrous focal tuberculosis
C. Tuberculoma
D. Acute focal tuberculosis
E. Acute cavernous tuberculosis

6. The dentist examines a pregnant woman. There are 3 round lesions up to 1 cm in diameter on her oral mucosa. The lesions appeared 3 days ago, they have white-gray surface and red margin. The dentist can make the following diagnosis:

A. Aphthous stomatitis
B. Leukoplakia
C. Catarrhal stomatitis
D. Necrotizing ulcerative stomatitis
E. Gangrenous stomatitis

7. A 28-year-old patient presented with elevated blood pressure, hematuria, and facial edemas. Despite the treatment, the signs of renal failure were exacerbating. 6 months later the patient died of uremia. Microscopy of the kidneys shows proliferation of nephrothelium in the glomerular capsules and proliferation of podocytes that contributes to crescent formation. Sclerosis and hyalinosis of the glomeruli are observed. Make the diagnosis.

A. Subacute glomerulonephritis
B. Acute pyelonephritis
C. Nephrotic syndrome
D. Chronic glomerulonephritis
E. Acute glomerulonephritis

8. During teeth examination on the lateral surface of the first upper molar there was detected a cone-shaped carious cavity with the base oriented toward the tooth surface and the apex — toward the tooth center. Softened dentin is visible in the floor of the carious cavity. Make the diagnosis.

A. Dentin caries
B. Enamel caries

C. Cement caries
D. Tooth erosion
E. —

9. A 23-year-old man developed a perforation in his hard palate, a dense formation with clear margins was detected in this area. After a surgery, microscopy of the excised formation shows there a large focus of caseous necrosis surrounded with a granulation tissue with endovasculitis and a cellular infiltration consisting of lymphocytes and epithelioid cells with predominance of plasma cells. What is the most likely disease in this case?

A. Syphilis
B. Tuberculosis
C. Leprosy
D. Scleroma
E. Sarcoma

10. A 53-year-old woman complains of painful swelling in her left parotid area. The swelling appeared 5 days ago. Objectively the skin in this area is slightly hyperemic and tender. Excretory duct of the salivary gland produces a small amount of viscous turbid yellow-green liquid. Microscopy detects a diffuse infiltration of the gland with segmented neutrophils. Make the diagnosis.

A. Acute suppurative parotitis
B. Sjogren syndrome
C. Glandular adenoma
D. Acute serous parotitis
E. Epidemic parotitis

11. A 65-year-old man presents with acute mandibular osteomyelitis. 3 days after the disease onset he developed marked edema of skin and soft submandibular cervical tissues. Microscopically there is a diffuse infiltration with neutrophils. What complication of the main disease occurred in the patient's skin tissues?

A. Phlegmon
B. Abscess
C. Carbuncle
D. Furuncle
E. Actinomycosis

12. Oral examination revealed dark yellow and brown spots and stripes on the labial and lingual surfaces of the patient's teeth; more than half of the dental surface is affected; enamel and dentin are destroyed. What diagnosis is the most likely?

A. Fluorosis
B. Metastatic calcification
C. Dental calculus
D. Cuneiform defect
E. Dystrophic calcification

13. A 67-year-old patient with clinical diagnosis of chronic bronchitis, pneumosclerosis, and cardiopulmonary decompensation has the biopsy material taken from the suspicious area in his right bronchus mucosa. Cellular and tissue atypism along with pearly bodies can be histologically detected. What pathologic process is characterized by the described histological changes?

A. Squamous cell carcinoma of bronchus with keratinization
B. Acute bronchitis
C. Squamous cell metaplasia of bronchial mucosa
D. Bronchiectasis
E. Polypoid chronic bronchitis

14. During autopsy of the patient, who died of cardiovascular failure, the patient's right foot is darkly colored. The vessels of the patient's thigh are partially obstructed by grayish-red clots. On the vessel walls there are yellowish-gray spots and fibrous plaques, some of which are of stony density. What clinicopathological type of atherosclerosis was complicated in the patient?

A. Atherosclerosis of lower extremities
B. Cerebral atherosclerosis
C. Atherosclerosis of aorta
D. Vascular intestinal atherosclerosis
E. Renal atherosclerosis

15. A young woman presents with a tumour along the auditory nerve. The tumour is node-shaped, 3 cm in diameter, soft and elastic, pink-white coloured, and has homogeneous structure. Microscopically the tumour contains bundles of cells with oval nuclei. These cellular fibrous bundles form regular structures made up of parallel rows of regularly oriented cells

arranged in the form of a palisade with acellular homogeneous area in between (Verocay bodies). Name this type of tumour.

A. Neurinoma
B. Malignant neurinoma
C. Ganglioneuroma
D. Neuroblastoma
E. Ganglioneuroblastoma

16. Autopsy of a 60-year-old woman, who for a long time had been suffering from essential hypertension, shows significantly diminished kidneys (weight of both kidneys is 80 g) with finely granular surface. Uniform renal cortical thinning can be observed in section. Name the described changes in the kidneys:

A. Primary contracted kidney
B. Pyelonephritic contracted kidney
C. Secondary contracted kidney
D. Amyloid contracted kidney
E. Diabetic nephrosclerosis

17. Autopsy of a 3-year-old child shows a tumor in the cerebellum. The tumor has no clear margins separating it from the surrounding tissues. Histologically it is made of small atypical cells with hyperchromatic nuclei. This tumor is most likely a:

A. Medulloblastoma
B. Medullary sarcoma
C. Cancer metastasis
D. Sarcoma metastasis
E. Glioblastoma

18. Autopsy revealed a large wedge-shaped patch of dense dark red tissue with clear margins in the upper lobe of the right lung. Histological examination detected the necrosis of the alveolar walls; the alveolar lumen is tightly packed with erythrocytes. What process occurred in the lungs?

A. Hemorrhagic infarction
B. Carneous degeneration
C. Gangrene
D. Hemorrhage
E. Atelectasis

19. Regional lymph nodes surrounding an infected wound are enlarged. Histological examination shows an increased number of macrophages, lymphocytes, and lymphatic follicles in the cortical layer of the lymph nodes, as well as a large amount of plasma cells. What process in the lymph nodes is indicated by these histological changes?

A. Antigen stimulation
B. Acquired deficiency of lymphoid tissue
C. Congenital deficiency of lymphoid tissue
D. Neoplastic aberration
E. Transplant rejection

20. A patient has gradually developed a skin plaque on his face. In the center of this plaque there are a necrotic patch and an ulcer. Histopathological analysis of the biopsy material reveals proliferation of atypical epithelial cells with a large number of pathologic mitoses. What is the most likely diagnosis?

A. Skin cancer
B. Sarcoma
C. Papilloma
D. Trophic ulcer
E. Fibroma

21. Histological analysis of a biopsy skin sample obtained from a 24-year-old patient detects caseous necrosis surrounded with cellular infiltrate consisting of lymphocytes, among which there are single giant cells; proliferation of connective tissue and endovasculitis are observed. Characterize this pathologic process:

A. Proliferative granulomatous inflammation
B. Proliferative interstitial inflammation
C. Abscess
D. Catarrhal inflammation
E. Ichorous inflammation

22. Autopsy of a man, who had been suffering from mitral stenosis, reveals dense brown lungs. What pathologic process had occurred in the lungs?

A. Hemosiderosis
B. Hemochromatosis
C. Jaundice

D. Hemomelanosis
E. Lipofuscinosis

23. A 63-year-old man, who has been suffering from chronic diffuse obstructive pulmonary emphysema for 15 years, died of progressive heart failure. Autopsy shows nutmeg liver cirrhosis, cyanotic induration of kidneys and spleen, ascites, and edemas of the lower limbs. What type of heart failure can be characterized by such changes in the internal organs?
A. Chronic heart failure
B. Acute right ventricular failure
C. Chronic atrial failure
D. Acute left ventricular failure
E. Acute global heart failure

24. Histological analysis of a removed skin tumour shows clusters and bands composed of atypical stratified squamous epithelium cells that penetrate into the underlying tissue. What preliminary diagnosis can be made?
A. Non-keratinizing squamous cell carcinoma
B. Solid cancer
C. Carcinoma in situ
D. Papilloma
E. Adenoma

25. Autopsy of a man, who served on a nuclear submarine, revealed the following pathologies: bone marrow atrophy (panmyelophthisis), anemia, leukopenia, thrombocytopenia, lymphocytic disintegration in the lymph nodes, spleen, gastrointestinal lymphatic system, and hemorrhages into the adrenal glands. What disease had developed in this case?
A. Acute radiation sickness
B. Decompression sickness
C. Acute leukemia
D. Acute anemia
E. Vibration disease

26. A 9-month-old child presents with delayed tooth eruption, improper sequence of tooth eruption, and horizontal maxillary configuration (high-arched palate). Microscopically enamel mineralization pattern is irregular, enamel columns are wrinkled, some of them are vacuolated, pre-

dentin zones are widened, single denticles can be observed. What disease is it?

A. Early rickets
B. Late rickets
C. Osteomalacia
D. Gout
E. Hypervitaminosis D

27. Autopsy of a 58-year-old man, who for a long time has been drinking alcohol in large amounts and died at home, is being conducted. Macroscopically the right lung is dense and enlarged, its tissue is gray and homogeneous on section, its pleura is covered with grayish membranous deposits. Microscopically the alveolar cavities contain fibrin threads, neutrophils, and hemolysed erythrocytes. Make the diagnosis:

A. Croupous pneumonia
B. Focal pneumonia
C. Interstitial pneumonia
D. Primary pulmonary tuberculosis
E. Caseous pneumonia

28. Autopsy of a 49-year-old woman who died of chronic kidney failure shows small dense striated kidneys with areas of hemorrhages. Microscopically nuclei of epithelial channels contain hematoxylin bodies; glomerular capillaries resemble wire loops, have thickened basement membranes, and in places contain hyaline thrombi and foci of fibrinoid necrosis. What is the most likely diagnosis?

A. Systemic lupus erythematosus
B. Rheumatism
C. Arteriolosclerotic nephrosclerosis
D. Amyloidosis
E. Atherosclerotic nephrosclerosis

29. A 34-year-old man died in a comatose state. According to his family after a business trip to an African country, he developed periodical jaundice attacks. Autopsy shows the following: dense enlarged spleen with slate-black pulp; enlarged plethoric liver, gray-black on section; cerebral grey matter is brown-gray; cerebral white matter contains numerous small hemorrhages. What infectious disease can be suspected?

A. Malaria

B. Meningococcemia
C. Prion infection
D. Generalized herpetic infection
E. Generalized cryptococcosis

30. A 27-year-old woman has undergone a sector resection of mammary gland tissue. Macroscopy detects a dense white node, 4 cm in diameter, with clear margins in the excised tissue. Immediate histological analysis shows the tumor to consist of a large amount of fibrous stroma with stromal proliferation around the small canaliculi. Canalicular epithelium overlays the basement membrane and retains its polarity. Make the diagnosis:
A. Pericanalicular fibroadenoma
B. Adenocarcinoma
C. Sarcoma
D. Dyshormonal disorders
E. Cancer

31. In the course of an urgent surgery, the vermiform appendix of the patient was excised. The appendix was acutely distended and gray-black throughout its whole length. In the distal segment a defect of the appendix wall was detected, through which a foul-smelling gray-brown substance was being discharged from the appendix lumen. Histological analysis shows necrotization of the appendix wall with hemorrhagic foci; lumen of the mesenteric artery is filled with a thrombus. What type of appendicitis is it?
A. Acute gangrenous
B. Acute phlegmonous
C. Acute simple
D. Acute superficial
E. Chronic

32. A 39-year-old man underwent a surgery for peptic ulcer disease of the stomach. He died 7 days after the surgery. On autopsy the peritoneal layers are plethoric, dull, and covered with massive yellow-green membranous deposits. The peritoneal cavity contains approximately 300 mL of thick yellow-green fluid. What pathologic process was detected in the peritoneal cavity?
A. Fibrinopurulent peritonitis
B. Serous peritonitis
C. Serofibrinous peritonitis

D. Peritoneal commissures
E. Fibrinohemorrhagic peritonitis

33. A man died 8 days after the beginning of the disease. He was diagnosed with dysentery. On autopsy it was found out a thickened wall of the sigma and rectum, fibrinous membrane on the surface of mucous membrane. Histologically: there is a deep necrosis of mucous membrane with infiltration of necrotic masses with fibrin. What kind of colitis corresponds to the changes?
A. Diphtheritic
B. Catarrhal
C. Ulcerative
D. Chronic
E. Gangrenous

34. A patient ill with diabetes mellitus felt acute pain in his right foot. Objectively: foot thumb is black, foot tissues are edematous, there are foci of epidermis desquamation, stinking discharges. What clinicopathological form of necrosis is it?
A. Moist gangrene
B. Bedsore
C. Sequestrum
D. Dry gangrene
E. Infarction

35. On autopsy it is revealed that the kidneys are enlarged, the surface is large-granular because of multiple cavities with smooth walls, which are filled with clear fluid. What kidney disease did the patient have?
A. Polycystic kidney
B. Necrotic nephrosis
C. Pyelonephritis
D. Glomerulonephritis
E. Infarction

36. A patient died under conditions of cardiovascular insufficiency. Autopsy results: postinfarction cardiosclerosis, myocardium hypertrophy and dilatation of its cavities, especially of its right ventricle. Liver is enlarged, its surface is smooth, the incision revealed that it was plethoric, with dark-red specks against the background of brownish tissue. Histologi-

cally: plethora of central parts of lobules; peripheral parts around portal tracts contain hepatocytes in a state of adipose degeneration. How are these liver changes called?

A. Nutmeg liver
B. Pseudonutmeg liver
C. Amyloidosis
D. Liver cirrhosis
E. Liver steatosis

37. On autopsy of the 40-year-old woman suffering from rheumatic arthritis, the enlarged solid spleen was revealed. On section its tissue is of the mahogany color with enlarged follicles, which look like semi-transparent grayish-whitish grains. What pathological process is the most likely?

A. Sago spleen
B. Glaze spleen
C. Waxy spleen
D. Hyaline spleen
E. Porphyric spleen

38. On microscopic examination of the enlarged neck gland of a 14-year-old girl it was revealed destruction of the tissue structure of the node, absence of the lymph follicles, sclerotic and necrosis parts. Cell constitution of the node is polymorphous; lymphocytes, eosinophils, atypical cells of the large size with multiple-lobule nuclei (Berezovsky-Shternberg cells) and one nucleus cell of the large size are present. What is the most likely diagnosis?

A. Lymphogranulomatosis
B. Acute lympholeukosis
C. Chronic lympholeukosis
D. Berkitt's lymphoma
E. Fungoid mycosis

39. On autopsy it was revealed: large (1–2 cm) brownish-red, easy crumbling formations covering ulcerative defects on the external surface of the aortic valve. What is the most likely diagnosis?

A. Polypus-ulcerative endocarditis
B. Recurrent warty endocarditis
C. Acute warty endocarditis

D. Fibroblastic endocarditis
E. Diffusive endocarditis

40. A worker of a cattle farm fell acutely ill and then died from the progressing intoxication. Autopsy revealed enlarged, hyposthenic spleen of dark-cherry colour when dissected; excessive pulp scraping. At the base and fornix of brain pia maters are edematous, soaked with blood, dark-red ("scarlet hat"). Microscopic examination revealed serous haemorrhagic inflammation of brain tissues and tunics along with destruction of small vessel walls. What is the most likely diagnosis?
A. Anthrax
B. Tularemia
C. Brucellosis
D. Plaque
E. Cholera

**Exercise 3. Translate word-combinations from English into Ukrainian.**

Signs of fatty degeneration; flat and cylindrical bones; dull, matt, and flaccid cardiac muscle; multilayer, strongly keratinized pavement epithelium; increased blood viscosity; uterine bleeding after delivery; to reveal enlarged solid spleen; nutmeg liver; to detect a dense node with clear margins; to be covered with membranous deposits; to contain fibrin threads; delayed tooth eruption; kidneys with finely granular surface; spots and stripes on the surfaces of the patent's teeth; excretory duct of the salivary gland; the floor of the ulcerative cavity; crescent formation; pyogenic layer; to crunch on section; focal non-suppurative inflammation.

**Exercise 4. Find the synonyms from the tests.**

purulent —
thrombus —
adipose —
change —
decompensation —
substance —
tunic —
edge —
childbirth —
investigation —

**Exercise 5. Fill in the table.**

| Noun | Verb | Adjective |
|---|---|---|
| | investigate | |
| | | exudative |
| location | | |
| | | alterable |
| | feel | |
| dilatation | | |
| | | moist |
| | diminish | |
| | obstruct | |
| | | communicative |

**Exercise 6. Translate sentences from Ukrainian into English.**

1. Гломерулонефрит — це вогнищеве негнійне запалення ниркових клубочків з характерними нирковими ознаками.

2. Легені не спадають, забарвлені в блідо-сірий колір, на розрізі хрустять.

3. У жінки, яка страждала на гіпертонію, було виявлено значно зменшені нирки з дрібнозернистою поверхнею.

4. Макроскопія виявила в зразку тканини щільний білий вузол діаметром 4 см, з чіткими краями.

5. У пацієнта з хронічною серцевою недостатністю спостерігається підвищена в'язкість крові.

6. Альвеолярні порожнини містять фібринові нитки, нейтрофіли й еритроцити.

7. У печінці є ознаки жирової дегенерації та лейкемічні інфільтрати.

8. Ознакою раннього рахіту є затримка прорізування зубів у дітей.

9. Права легеня щільна і збільшена, а плевра її вкрита сіруватим мембранним налітом.

10. При гострому гнійному паротиті вивідна протока слинної залози виробляє невелику кількість в'язкої рідини.

**Exercise 7. Match words with their definitions.**

| | |
|---|---|
| Congestion | Coat or covering; one of the enveloping layers of a part, especially one of the coats of a blood vessel or other tubular structure |
| Tunic | The edge or border of the tissue removed in cancer surgery |
| Tumor | A small, abnormal patch of tissue on a body part or an organ, may also be a build-up of substances from a fluid, such as cholesterol in the blood vessels |
| Shin | An excessive or abnormal accumulation of blood or other fluid in a body part or blood vessel |
| Lumen | An area of the skin that has changes in texture or color and may look inflamed or irritated |
| Margin | The cavity or channel within a tube or tubular organ such as a blood vessel or the intestine |
| Plaque | Listening to the sounds of the body during a physical examination |
| Rash | A swelling of a part of the body, generally without inflammation, caused by an abnormal growth of tissue, whether benign or malignant |
| Auscultation | In size or strength as a result of disease or injury or lack of use. Synonyms: atrophied, wasted |
| Diminished | The front of the leg below the knee |

**Exercise 8. Fill in the gaps and read about Cholelithiasis:**

**Complaints.** He's actually had _____ epigastric pain for 2 days, although last night's episode was by far the worst. The pain is_____ by nausea and he _____ once. He's not a smoker. No history of ulcer disease or _____ reflux. No history of gallstones.

| |
|---|
| *Accompanied, Intermittent, Vomit, Esophageal* |

**Physical findings:**

Temperature = 101 F

Pulse = 94 and regular

B/P = 120/82 mmHg

Respirations = 18 and without labor

**Physical:**

Pupils equally reactive light and accommodation, ____ appear slightly icteric. Wonder if he has noticed a change?

Lung fields are clear to auscultation.

Heart sounds are normal, no ____ or third heart sounds, PMI is in the mid _____ line.

Abdomen is extremely tender, bowel sounds are diminished.

____ exam shows mild prostate enlargement, normal rectal sphincter tone, stool negative for occult blood.

| *Sclera Rectal Murmurs Clavicular* |
|---|

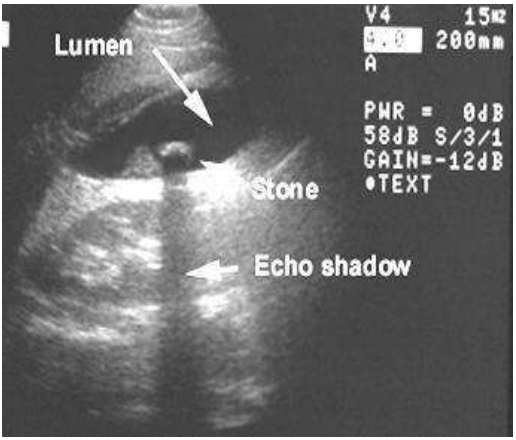


Image of gallbladder

Mr. Stein's history, abdominal ultrasound and labs are adding up to something seriously wrong with his liver and/or ___ tree.

History and physical signs are consistent with acute gallbladder disease. Location of pain, abdominal tenderness, nausea.

Scleral icterus. Elevated ____.

Abdominal ____ shows a gallstone in the gallbladder and ____ biliary tree. Is there one stuck further down?

Chemistry values are off. Pattern suggests liver parenchymal and biliary disease. (Which lab value is telling us what part of the ____ is involved?)

CBC suggests an acute inflammatory ____. What tells us this?

**Important clinical questions for now are:**

How long will he remain symptomatic, continue to have elevated liver enzymes and bilirubin if a stone has already passed?

| Liver, Bilirubin, Process, Dilated, Ultrasound, Biliary |
|---|

**Exercise 9. Discuss the following topics. Give definitions to the terms.**

Continued **biliary stasis**, pain, suffering, etc. .

Liver cell **necrosis**.

**Pancreatitis**.

Calcium could drop leading to a fatal arrhythmia (why?)

Problems in the future could include diabetes

**Exercise 10. Read, translate and make diferrential diagnosis. Say what analyses would you need to make a correct diagnosis. Give definitions to the terms.**

Julie Mackenzie is a 3-year-old little girl who's brought to you because of a cough and flu-like symptoms. Her aunt is the one with her today because Julie's parents are on a week's vacation. They have given permission for medical care as needed. Julie and her aunt are waiting for you in the examining room.

**Cough:** It's worse when she first gets up in the morning.

Kind of a "hack," and it's non-productive (no sputum).

Neither parent smokes.

Her aunt doesn't smoke.

Julie is on no medication.

She's been to daycare this week, but no one there is sick.

Julie lives in a 4-year-old house, and most of it is carpeted.

The family owns a cat.

Julie's parents are on a short Caribbean cruise, and have been gone for three days.

**Exam:** Julie is a well-nourished little girl having appropriate physical development for three years of age. She is appropriately curious but doesn't want to be separated from her aunt.

**Vital signs:**

T = 99.2

P = 88 and regular
BP = 122/74 mmHg
R = 18 and regular
Mildly reddened pharynx with slight **post nasal drainage.**
Mildly enlarged tonsils.
Ear drums clear with no fluid
No significant cervical lymph **adenopathy.**
Mild **wheezing** over both lung fields
Heart sounds normal, no **murmurs.**
No **abdominal masses**

**Exercise 11. Explain medical terms.**

| |
|---|
| Eosinophilia — |
| Osteomyelitis — |
| Glomerulonephritis — |
| Aminoacidemia — |
| Pneumonia — |
| Obesity — |
| Splenomegaly — |
| Hypoglycemia — |
| Peritoneum — |
| Albuminosis — |

# *UNIT 7*
# PATHOLOGICAL PHYSIOLOGY

**Exercise 1. Key words.**

| Noun | Verb | Adjective | Adverb |
|---|---|---|---|
| adolescent | associate | brief | acutely |
| appearance | confirm | dry | completely |
| contraction | correspond | excessive | prominently |
| deficiency | describe | exhausting | rapidly |
| digestion | deteriorate | foamy | |
| disturbance | irradiate | frequent | |
| drop | observe | healthy | |
| edema | starve | intense | |
| enlargement | | itching | |
| eructation | | lacerated | |
| failure | | obliterating | |
| fluctuation | | profuse | |
| intoxication | | shallow | |
| peptic ulcer | | sour | |
| probability | | total | |
| resection | | unconscious | |
| suppression | | valvular | |
| victim | | | |

**Exercise 2. Read the tests.**

1. A patient was hospitalized in a comatose state. The patient has a 5-year-long history of diabetes mellitus type 2. Objectively respiration is noisy, deep, with acetone breath odor. Blood glucose is 15.2 mmol/L, ketone bodies — 100 μmol/L. These signs are characteristic of the following diabetes complication:

A. Ketoacidotic coma
B. Hepatic coma
C. Hyperglycemic coma
D. Hypoglycemic coma
E. Hyperosmolar coma

2. A 63-year-old man suffers from esophageal carcinoma, presents with metastases into the mediastinal lymph nodes and cancerous cachexia. What pathogenetic stage of the neoplastic process is observed in the patient?

A. Progression
B. Promotion
C. Transformation
D. Initiation
E. —

3. After a prolonged attack of severe headache the patient lost mobility in his left arm and leg. Muscle tone is decreased in the affected limbs, the muscles are spasmed, spinal tendon reflexes are acutely intensified, reflex zones are increased. What the nervous system disorder can be observed in this patient?

A. Central paralysis
B. Peripheral paralysis
C. Extrapyramidal paralysis
D. Flaccid paralysis
E. Reflex paralysis

4. Hematologic study shows the following pattern: erythrocytes — $2.8 \cdot 10^{12}$/L, Hb — 80 g/L, color index — 0.85, reticulocytes — 0.1%, platelets — 160 thousand per microliter, leukocytes — $60 \cdot 10^{9}$/L. Basocytes — 2%, eosinophils — 8%, promyelocytes — 5%, myelocytes — 5%, juvenile — 16%, stab neutrophils — 20%, segmented neutrophils — 34%, lymphocytes — 5%, monocytes — 5%. This clinical presentation indicates the following blood pathology:

A. Chronic myeloid leukemia
B. Acute myeloid leukemia
C. Hypoplastic anemia
D. Undifferentiated leukemia
E. Hemolytic anemia

5. Antileukocytic antibodies are detected in the blood of a patient with leukopenia. What type of Coombs-Gell hypersensitivity reaction developed in this case?

A. Cytotoxic
B. Stimulating
C. Anaphylactic
D. Delayed-type hypersensitivity
E. Immune complex-mediated

6. A patient with obliterating endarteritis has undergone a ganglionic sympathectomy. Positive therapeutic effect of this surgery is associated with development of arterial hyperemia of the lower limbs, which can be described as:

A. Neuroparalytic
B. Neurotonic
C. Metabolic
D. Reactive
E. Working

7. In an experiment a laboratory rat was subjected to a stress factor (electric current), which resulted in muscular hypotonia, arterial hypotension, hypothermia, and hypoglycemia in the animal. What period of general adaptation syndrome is it?

A. Shock phase
B. Antishock phase
C. Resistance stage
D. Exhaustion stage
E. —

8. A 14-year-old adolescent has diphtheria. During the peak of the disease against the background of acute drop in body temperature and tachycardia the blood pressure is 70/50 mm Hg. What type of vascular tone disturbance is it?

A. Acute hypotension
B. —
C. Chronic hypotension
D. Somatoform autonomic dysfunction
E. Essential hypotension

9. 24 hours after an appendectomy the patient's blood test shows neutrophilic leukocytosis with a regenerative shift. What is the most likely mechanism of absolute leukocytosis development in the patient's peripheral blood?

A. Intensification of leukopoiesis
B. Leukocyte redistribution
C. Decreased leukocyte disintegration
D. Deceleration of leukocyte migration to the tissues
E. Immunity activation

10. A 59-year-old man, a business manager, developed intense burning retrosternal pain that irradiates to the left arm. The pain occurred in the evening after the tax audit. 15 minutes later the patient's condition normalized. What mechanism of angina pectoris development is leading in this patient?

A. Increased level of blood catecholamines
B. Coronary atherosclerosis
C. Intravascular aggregation of blood cells
D. Coronary artery thrombosis
E. Functional cardiac overload

11. A 30-year-old person has been stung by a bee. The stung area exhibits edema, hyperemia, and elevated temperature. What is the initial pathogenetic factor of inflammatory edema in this case?

A. Increase of microvascular permeability
B. Increase of osmotic pressure in the inflammation focus
C. Decrease of oncotic blood pressure
D. Increase of capillary blood pressure
E. Disturbed lymphatic efflux

12. A 30-year-old woman developed facial edemas. Examination detected proteinuria (5.87 g/L), hypoproteinemia, dysproteinemia, and hyperlipidemia. Such combination of signs is characteristic of:

A. Nephrotic syndrome
B. Nephritic syndrome
C. Chronic pyelonephritis
D. Acute kidney failure
E. Chronic kidney failure

13. An unconscious young man in the state of morphine intoxication has been brought into an admission room. The patient's respiration is slow and shallow due to suppression of the respiratory center. What kind of respiratory failure occurred in this case?

A. Ventilatory dysregulation
B. Ventilatory obstruction
C. Ventilatory restriction
D. Perfusion
E. Diffusion

14. The changes in the patient's ECG manifested as prolongation of the interval, followed by an increase in the number of missing ventricular complexes. Finally, the atria began to contract at the rate of 70/min, while the ventricles were contracting with a rate of 35/min. The observed rhythm disturbance suggests:

A. Bradycardia
B. Intraventricular block
C. Extrasystoles
D. Intraatrial block
E. Atrioventricular block

15. A patient has been suffering from bronchial asthma for 15 years. What changes in the patient's leukogram can be expected in this case?

A. Eosinophilia
B. Basophilia
C. Leukocytosis
D. Leukopenia
E. Left shift

16. A poisoning caused by sulema (mercury dichloride) occurred at a factory. Two days later, the person, who had suffered from the sulema exposure, developed the 24-hour diuresis of 620 mL, headache, vomiting, convulsions, and dyspnea. What diagnosis can be made in this case?

A. Acute renal failure
B. Chronic renal failure
C. Uremic coma
D. Pyelonephritis
E. Glomerulonephritis

17. A 56-year-old woman complains of pain in the small joints of her hands and feet. She has been experiencing these symptoms for the last 12 years. Examination of her hands detects a subluxation of the metacarpophalangeal joints with fingers bent outwards («walrus fippers»). There are high molecular weight immune complexes in the patient's blood. What diagnosis can be made in this case?

A. Rheumatoid arthritis
B. Gouty arthritis
C. Rheumetic polyarthritis
D. Systemic lupus erythematosis
E. Dermatomyositis

18. A patient is diagnosed with severe B12 deficiency anemia resulting in disturbed hematopoiesis and appearance of atypical erythrocytes in the blood. The patient has a history of total gastric resection. This diagnosis can be confirmed if the following cells are present in the peripheral blood:

A. Megalocytes
B. Microcytes
C. Elliptocytes
D. Normocytes
E. Anulocytes

19. A patient with asphyxia after a brief respiratory arrest developed single infrequent respirations with passive expiration, after which he stopped breathing completely. What type of respiration was observed in this case?

A. Gasping respiration
B. Apneustic respiration
C. Kussmaul respiration
D. Cheyne-Stokes respiration
E. Biot respiration

20. A 3-year-old child has been brought by ambulance to the intensive care unit of the infectious diseases' hospital. On examination the child is in severe condition, skin and mucosa are dry, tissue turgor is reduced. The patient's history states that profuse diarrhea and recurrent vomiting were observed throughout the previous day after the child had eaten food prod-

ucts of poor quality. What type of salt and water imbalance is likely to have developed in the patient?

A. Hypoosmolar dehydration
B. Isoosmolar dehydration
C. Hyperosmolar hyperhydration
D. Isoosmolar hyperhydration
E. Hypoosmolar hyperhydration

21. A 48-year-old man is unconscious. He has a history of several syncopal episodes with convulsions. ECG shows deformed QRS complexes unconnected with P waves, atrial contractions are approximately 70/min, ventricular contractions — 25–30/min. Name the type of arrhythmia in this case:

A. Complete atrioventricular block
B. First-degree atrioventricular block
C. Second-degree atrioventricular block
D. Intraatrial block
E. Intraventricular block

22. A 40-year-old man with impaired venous patency in the lower limbs developed edemas. What mechanism plays the main role in the development of this disturbance?

A. Elevated filtration pressure
B. Positive fluid balance
C. Decreased gradient of osmotic pressure between blood and tissue
D. Disturbed humoral regulation of water — mineral balance
E. Hypoproteinemia

23. A pregnant woman developed severe toxemia with exhausting recurrent vomiting throughout the day. By the end of the day she developed tetanic convulsions and dehydration. The described changes were caused by the following type of acid-base imbalance:

A. Nongaseous excretory alkalosis
B. Gaseous alkalosis
C. Gaseous acidosis
D. Nongaseous metabolic acidosis
E. Nongaseous excretory acidosis

24. A 50-year-old man has been undergoing treatment for peptic ulcer disease of the stomach. His digestion normalized, pain disappeared, and general mood improved. However, several weeks later he again developed epigastric pain, heartburn, and sour eructation. How can this clinical course be characterized?

A. Relapse
B. Remission
C. Terminal state
D. Prodromal stage
E. Latent period

25. A patient with essential hypertension presents with circadian fluctuations in total peripheral vascular resistance to blood flow. What vessels will be the most affected in this case?

A. Arterioles
B. Aorta
C. Capillaries
D. Arteriovenous anastomoses
E. Veins

26. On clinical examination a woman presents with excessive sweating, tachycardia, loss of weight, and tremor. What endocrine pathology can cause these signs?

A. Hyperthyroidism
B. Hypothyroidism
C. Hypergonadism
D. Hypogonadism
E. Hypoaldosteronism

27. A patient on the 2nd day after a cardiac infarction presents with an acute decrease of systolic blood pressure down to 60 mm Hg with tachycardia 140/min., dyspnea, loss of consciousness. What mechanism is essential in the pathogenesis of shock developed in this case?

A. Decreased cardiac output
B. Increased myocardial excitability caused by products of necrotic disintegration
C. Decreased circulating blood volume
D. Development of paroxysmal tachycardia
E. Development of anaphylactic reaction to myocardial proteins

28. Lower limbs of a patient with varicose veins were examined. The patient's legs are cyanotic and pastose, skin temperature is low, single petechiae are observed. What disturbance of hemodynamics is it?

A. Venous hyperemia
B. Compression ischemia
C. Obstruction ischemia
D. Thromboembolism
E. Arterial hyperemia

29. After a mechanical injury a tourniquet was applied to the patient's arm to stop the bleeding. Below the tourniquet the arm became pale and numb. This condition is caused by:

A. Compression ischemia
B. Venous congestion
C. Obstruction ischemia
D. Angiospastic ischemia
E. Thrombosis

30. A 36-year-old man traveled to the mountains for a vacation (altitude of 2000 meters above the sea level). He developed increased respiration rate, tachycardia, and slight dizziness. Two days later these signs disappeared. This process is called:

A. Adaptation
B. Compensation
C. Regeneration
D. Inhibition
E. Proliferation

31. 30 minutes after the dental treatment the patient developed red itching spots on the face and oral mucosa. The patient was diagnosed with urticaria. What bioactive substance with vasodilating and pruriginous effect is produced during this type of allergic reaction?

A. Histamine
B. Prostaglandin E2
C. Leukotriene B4
D. Interleukin-1
E. Bradykinin

32. A 16-year-old girl, who has been starving herself for a long time to lose weight, developed an edema. This phenomenon is mainly caused by:

A. Hypoproteinemia due to protein synthesis disturbance
B. Hypoglycemia due to glycogen synthesis disturbance
C. Venous congestion and increased venous pressure
D. Deceleration of glomerular filtration rate
E. Decreased production of vasopressin in the hypothalamus

33. The doctor stated the absence of respiration and cardiac activity in a traffic accident victim. This condition lasts for 1 minute already. This clinical presentation corresponds with the following terminal state:

A. Clinical death
B. Traumatic shock, erectile phase
C. Traumatic shock, torpid phase
D. Preagony
E. Agony

34. A 50-year-old man, who has been suffering from chronic hepatic failure for years, developed ascites. What is the main mechanism of development of this new disorder in the patient?

A. Increased pressure in the portal venous system
B. Decreased hepatic synthesis of albumins and globulins
C. Increased blood levels of low-density and very low-density lipoproteins
D. Appearance of neurotoxic substances in blood
E. Increased oncotic blood pressure

35. A 56-year-old man with a valvular defect complains of lower limb edemas that lately increased in frequency. Name the local pathogenetic factor of edema development in this case:

A. Increase of hydrodynamic blood pressure
B. Increase of oncotic blood pressure
C. Decrease of vessel wall permeability
D. Decrease of hydrodynamic blood pressure
E. Increase of interstitial pressure

36. A 50-year-old man suddenly developed intense palpitations, pain in the heart, acute weakness, increased blood pressure, and an irregular pulse with its deficit. ECG shows f-waves instead of a P-wave; R-R intervals are irregular. What heart rhythm disorder is observed in the patient?

A. Ciliary arrhythmia
B. Paroxysmal tachycardia
C. Transverse heart block
D. Respiratory sinus arrhythmia
E. Sinus extrasystole

37. Due to an accident on board a nuclear submarine, a soldier received a radiation dose of 5 Gy. He complains of headache, nausea, and vertigo. What changes in leukocyte number can be observed in this soldier after the irradiation?
A. Neutrophilic leukocytosis
B. Agranulocytosis
C. Eosinophilia
D. Lymphocytosis
E. Leukopenia

38. A patient was brought to the hospital with a lacerated wound of the maxillofacial area. Profuse bleeding from the wound could not be stopped for a long time. What disturbance of total blood volume will be observed within the first hour after the blood loss occurred?
A. Normocythemic hypovolemia
B. Oligocythemic hypovolemia
C. Polycythemic hypovolemia
D. Hypervolemia
E. No disturbances in blood volume

39. A 54-year-old woman has a total thyroidectomy for papillary thyroid carcinoma. 11 hours after operation she complains of tingling around her mouth. On physical examination, Trousseau's sign and Chvostek's sign are present. Her condition rapidly deteriorates with laryngospasm and focal seizures. The surgeon suggests surgical destruction of parathyroid glands. Which of the following is the most likely cause of this patient's neurologic abnormality?
A. Hypocalcemia
B. Hyponatremia
C. Hyperchloremia
D. Hypophosphatemia
E. Hyperkalemia

40. A 45-year-old woman comes to her physician with complaints of excessive fatigue and weakness. She says that these symptoms have been present for the past month. On further questioning, she admits having lost 3 kilograms in the last 2 weeks. On physical examination, she is a tired-appearing thin woman. Hyperpigmentation is present over many areas of her body, most prominently over the face, neck and back of hands (areas exposed to light). Increased production of which of the following hormones is the most likely cause of hyperpigmentation in this patient?

A. Melanocyte-stimulating hormone (MSH)
B. Growth hormone (GH)
C. Gonadotropins
D. β-Lipotropin
E. Thyroid-stimulating hormone (TSH)

**Exercise 3. Translate word-combinations from English into Ukrainian.**

Acetone breath odor; to loss mobility in an arm; the peak of the disease; initial pathogenetic factor of inflammation; to bring into admission room; shallow respiration; increased neuromuscular excitement; to undergo a resection; appearance of erythrocytes in the blood; to have a history of some diseases; to confirm the diagnosis; to develop tetanic convulsions and dehydration; to complain of heartburn, sour eructation epigastric pain; pale and numb limb; substance with vasodilating and pruriginous effect; terminal state of the patient; a lacerated wound; disturbance of total blood volume; shortness of breath; to be accompanied with cardiac cavity enlargement.

**Exercise 4. Find the synonyms from the tests.**

Dizziness —
Breathlessness —
Complication —
Insufficiency —
Emesis —
Perspiration —
Fainting —
Pruriginous —
Injury —
Belching —

**Exercise 5. Fill in the table.**

| Noun | Verb | Adjective |
|---|---|---|
| | | thick |
| | odorize | |
| | | connective |
| irradiation | | |
| | | reddish |
| exhaustion | | |
| | disturb | |
| | | enlarged |
| deterioration | | |
| | improve | |

**Exercise 6. Translate the sentences from Ukrainian into English.**

1. Хворого було доставлено до лікарні з рваною раною щелепно-лицевої ділянки.
2. Гістамін виробляється під час алергічної реакції і має судинорозширювальну та сверблячу дію.
3. Через механічну травму рука стала блідою і онімілою.
4. Хворі з виразковою хворобою шлунка скаржаться на епігастральний біль, печію та кислу відрижку.
5. Пацієнту, який страждає на дифузний зоб, необхідно виконати резекцію щитоподібної залози.
6. Знижене вироблення паратгормону супроводжується посиленим нервово-м'язовим збудженням.
7. Для підтвердження діагнозу пацієнта направили на генетичну консультацію.
8. Після сильного токсикозу з виснажливим блюванням у вагітної жінки розвинулися тетанічні судоми та зневоднення.

**Exercise 7. Match words to their definitions.**

| | |
|---|---|
| Metoprolol | It is flat with depressed ridges along the sides where the costal cartilages of the 3rd to 7th pairs of ribs articulate inferior to the sternal angle |
| Contraindications | Term that is often used in healthcare to indicate that something is benign |
| Jaw | A feeling of sickness or discomfort in the stomach that may come with an urge to vomit |
| Sternum | A medication that lowers your blood pressure and heart rate, making it easier for your heart to pump blood to the rest of your body. It treats high blood pressure. It also prevents chest pain or further damage after a heart attack |
| Nauseated | Blockage of a passageway |
| Cannulae | The movable junction of the bones below the mouth (the mandible) and the bone just above the mouth (the maxilla) |
| Stable | Specific situation in which a drug, procedure, or surgery should not be used because it may be harmful to the person |
| Obstruction | The middle muscular layer of the wall of the heart |
| Myocardium | Good physical health, with no acute or chronic health problems for which medical treatment beyond routine medical care is required |
| Unremarkable | A thin tube that doctors insert into a person's body cavity, such as their nose, or into a vein |

**Exercise 8. Fill in the gaps.**

Mr. W. G. is a 53-year-old white man who began to experience chest discomfort while playing tennis with a friend. At first, he attributed his discomfort to the heat and having had a large breakfast. Gradually, however, discomfort intensified to a crushing sensation in the ___ area and the pain seemed to spread upward into his neck and lower ____. The nature of the pain did not seem to change with deep breathing. When Mr. G. complained of feeling ____ and began rubbing his chest, his tennis partner was concerned that his friend was having a heart attack and called 911 on his cell phone. The patient was transported to the ED of the nearest hospital

and arrived within 30 minutes of the onset of chest pain. En route to the hospital, the patient was placed on nasal ___and an IV D5W was started. Mr. G. received aspirin (325 mg po) and 2 mg/IV morphine. He is allergic to meperidine (rash). His pain has eased slightly in the last 15 minutes but is still significant; was 9/10 in severity; now 7/10. In the ED, chest pain was not relieved by 3 SL NTG tablets. He denies chills.

Patient history showed no _____ to thrombolysis. The patient received IV reteplase, IV heparin, _____, and lisinopril. Approximately 90 minutes after initiation of reteplase therapy, the patient's chest pain and ST segment elevations had resolved and both heart rate and blood pressure had normalized. The patient was ____ until two days after admission when he began to experience chest pain again. Emergency angiography revealed a 95% _____ in the left anterior descending coronary artery. No additional ____ was at risk—consistent with single-vessel coronary artery disease and completed AMI. Percutaneous transluminal coronary angioplasty of the vessel was successfully performed, followed by placement of a coronary artery stent. After the stent was placed, the patient received abciximab infusion. Ejection fraction by echocardiogram three days post-AMI was 50% and the patient's temperature was 99.5°F. The remainder of the patient's hospital stay was _____. He was gradually ambulated, physical activity was slowly increased, and he was discharged eight days post-AMI.

| Metoprolol, Contraindications, Jaw, Sternal, Nauseated, Cannulae, Stable, Obstruction, Myocardium, Unremarkable |
|---|

**Exercise 9. Read, translate and give definitions to the terms.**

After administration of low doses of the hydrochlorothiazide (which blocks sodium reabsorption) and triamterene (which reduces potassium excretion) **diuretics**, the patient voided 4.500 mL clear, yellow urine during the first 24 hours and another 3.500 mL during the second day post-admission. Bibasilar "crackles" and dependent **edema** also **subside**d. The patient lost three pounds in total body weight. Vital signs were as follows: BP 115/80 (right arm, sitting); P 88 and regular; RR 16 and unlabored; PaO2 (room air) 90; $PaCO_2$ 44. H. J. was discharged on day 4 with prescription medicines and orders to pursue a follow-up with a cardiologist as soon as possible.

**Exercise 10. Read, translate and make diagnoses. Give definitions to the terms in bold.**

| | |
|---|---|
| *History of Present Illness*<br>J. B. is an overweight, 58-year-old man who has had swelling in his left foot and ankle and pain in his left calf for six days. The pain has been getting worse for the past 24 hours. The patient ranks the pain as 8/10. He has made an appointment today with his PCP. | *Past Medical History*<br>Previous episode of DVT at age 54; treated with warfarin for 1 year<br>Diagnosed with diabetes mellitus type 2, 5 years ago A preliminary diagnosis of DVT is made and the patient is admitted to the hospital for a thorough clinical workup. |
| *Family History*<br>Father died at age 63 from **myocardial infarction**<br>Mother alive at age 80 with diabetes mellitus type 2<br>Brother, age 56, alive and healthy<br>No family history of **venous thromboembolic disease** reported | *Social History*<br>Patient is single and lives alone<br>Works as dean of pharmacy school, 11 years<br>28 pack-year smoking history, currently smokes 1 pack per day<br>Drinks 3–4 beers/day during the week and a 6-pack/day on weekends<br>No history of illicit drug use |
| *Medications*<br>Glyburide 5 mg po QD 3 years<br>Denies taking any **over-the-counter** or herbal products | *Allergies*<br>Penicillin causes a rash<br>Cat dander causes watery eyes and sneezing |
| *Physical Examination and Laboratory Tests*<br>General J. B. is a pleasant, overweight, white male in moderate acute distress from leg pain.<br>Vital Signs BP 130/80; P 110; RR 16; T 99.8°F; Ht 510<br>Wt 245 lb; $SaO_2$ 98% on room air | *Head, Eyes, Ears, Nose, and Throat*<br>Atraumatic<br>Pupils equal, round, and reactive to light and accommodation<br>Extraocular movements intact<br>Fundi normal<br>Normal sclera<br>Ears and nose clear<br>Tympanic membranes intact<br>Oral mucous membranes pink and moist |

| | |
|---|---|
| *Neck*<br>Supple<br>No **cervical adenopathy**<br>Thyroid nonpalpable<br>No carotid bruits<br>No jugular venous distension | *Chest*<br>Bilateral wheezing<br>No crackles |
| *Heart*<br>Regular rate and rhythm<br>Distinct S1 and S2<br>No S3 or S4<br>No murmurs, rubs, or gallops | *Abdomen*<br>Soft, non-tender, and non-distended<br>No masses, guarding, rebound, or rigidity<br>No **organomegaly**<br>Normal bowel sounds |
| *Genitalia*<br>Normal penis and testes | *Rectal*<br>No masses<br>Heme-negative brown stool |
| *Extremities*<br>No clubbing or cyanosis<br>Left foot and ankle swollen<br>Left calf swollen to twice normal size<br>No tenderness, pain, swelling, or redness, right lower extremity | *Neurological*<br>Alert and oriented<br>No neurologic deficits noted |
| *Doppler Ultrasound*<br>Left lower extremity shows no flow of the left posterior tibial vein<br>Normal flow demonstrated within the left common femoral and iliac veins<br>Right lower extremity shows normal flow of the deep venous system from the level of the common femoral to posterior tibial vein | ***Diagnosis*** |

**Exercise 11. Explain medical terms.**

| |
|---|
| Hyperpigmentation — |
| Rheumatoid arthritis — |
| Hypertension — |
| Leukopenia — |
| Vasodilating — |
| Tachycardia — |
| Osteoporosis — |
| Dehydration — |
| Hypoproteinemia — |
| Appendectomy — |

# *UNIT 8*
# MICROBIOLOGY

## Chapter I

**Exercise 1. Key words.**

| Nouns | Verbs | Adjectives | Adverbs |
|---|---|---|---|
| assay | impregnate | arcuate | facultatively |
| feces | infest | curved | hardly |
| flagellum (pl. flagella) | inoculate | deglutitive | particularly |
| leprosy | interpret | immature | previously |
| medium | invade | inguinal | provisionally |
| motility | soak | lumpy | |
| plague | specify | monotrichous | |
| precursor | stain | ovoid | |
| protozoa | withstand | pyriform | |
| rodent | | raw | |
| scabies | | rod-shaped | |
| scrape | | stillborn | |
| staining | | suctorial | |

**Exercise 2. Read the tests.**

1. From the feces of a patient with acute gastroenteritis a pure culture of microorganisms was obtained. The microorganisms are small mobile slightly curved gram-negative bacilli that within 6 hours grow into a light blue film on the 1% alkaline peptone water. Such properties are characteristic of the following microorganism:

A. Vibrio
B. Spirochaete
C. Clostridium
D. Bacillus
E. Spirillum

2. A patient was brought into the infectious diseases' hospital on the 8th day after the disease onset. The patient complains of headache, malaise, and weakness. A sample of blood was taken for the serological test. Widal agglutination test results with blood sample diluted 1:200 and typhoid fever O-diagnosticum were positive. What diagnosis can be made based on the results of this test?

A. Typhoid fever
B. Dysentery
C. Cholera
D. Leptospirosis
E. Tuberculosis

3. A patient presented with indigestion, stomachaches, and excessive salivation. Similar symptoms had already been observed in this patient previously. Laboratory analysis detected oval eggs covered with lumpy capsules in the patient's feces. What is the most likely cause of the patient's disorder?

A. Ascariasis
B. Trichocephaliasis
C. Diphyllobothriasis
D. Enterobiasis
E. Fascioliasis

4. A medical student was hospitalized into the infectious diseases' unit on the 2nd day after the disease onset; the patient is suspected to have infectious mononucleosis. What results of laboratory analysis can confirm this diagnosis immediately on the day of the hospitalization?

A. IgM antibodies to Epstein-Barr virus were detected
B. IgM antibodies to herpes simplex virus were detected
C. Fourfold increase in number of antibodies to Epstein-Barr virus was detected
D. Herpes virus was isolated
E. Cytomegalovirus antibodies were detected

5. A 40-year-old man developed skin redness and swelling in the neck area, where eventually a small abscess appeared. On section the focus is dense and yellow-green colored. In the purulent masses there are white granules. Histologically there are fungal druses, plasma and xanthoma

cells, and macrophages detected. Specify the most correct etiological name of this pathological process:

A. Actinomycosis
B. Furuncle
C. Carbuncle
D. Syphilis
E. Leprosy

6. A toxin neutralized with 0.4% formaldehyde under 37–40°C for 4 weeks is used for vaccination. This preparation was first used by Gaston Ramon for diphtheria prevention. Name this preparation:

A. Anatoxin
B. Immunoglobulin
C. Antitoxic serum
D. Adjuvant
E. Inactivated vaccine

7. It is planned to use the territory of an old cattle burial ground (which has not been used for more than 50 years) for building houses. But ground analysis revealed the presence of the pathogen of a very dangerous illness. Which of the indicated microorganisms is likely to remain in the ground for such a long time?

A. *Bacillus anthracis*
B. *Mycobacterium bovis*
C. *Brucella abortus*
D. *Francisella tularensis*
E. *Yersinia pestis*

8. Sanitary bacteriological research on water by the membrane filter method revealed two red colonies on a membrane filter (Endo agar) through which 500 ml of analyzed water were passed. Calculate the coli index and coli titer of the analyzed water:

A. 4 and 250
B. 2 and 500
C. 500 and 2
D. 250 and 2
E. 250 and 4

9. While examining a patient an otolaryngologist noticed hyperaemia and significantly edematous tonsils with a grayish film upon them. Microscopical examination of this film revealed some gram-positive bacilli placed at an angle with each other. What disease might be suspected?

A. Diphtheria
B. Meningococcal nasopharyngitis
C. Epidemic parotitis
D. Angina
E. Scarlet fever

10. A man who was bitten by the unknown dog applied to the surgeon. Wide ragged wounds were localized on the face. What curative-prophylactic aid should be given to prevent rabies?

A. Start immunization with rabies vaccine
B. Hospitalize the patient and keep under the doctor's supervision
C. Immediately inject normal gamma globulin
D. Prescribe combine antibiotic therapy
E. Immediate injection of DPT vaccine

11. In a patient with clinical signs of immunodeficiency the number and functional activity of T and B lymphocytes are not changed. Defect with dysfunction of antigen-presentation to the immunocompetent cells was found during investigation on the molecule level. Defect of what cells is the most probable?

A. Macrophages, monocytes
B. 0-lymphocytes
C. NK-cells
D. T-lymphocytes, B-lymphocytes
E. Fibroblasts, T-lymphocytes, B-lymphocytes

12. Two weeks ago, an illness was reported in several children at the orphanage. Based on the description of its clinical manifestations and epidemiological data, the epidemiologist suspects an outbreak of measles infection. What type of laboratory analysis can confirm this provisional diagnosis?

A. Serology
B. Immunofluorescence
C. Rhinocytoscopy

D. Inoculation of chicken embryos
E. Allergy testing

13. A 5-year-old child is diagnosed with Bruton syndrome (X-linked agammaglobulinemia) that manifests itself as a severe clinical course of bacterial infections and absence of B lymphocytes and plasma cells. What changes of immunoglobulin content can be observed in the blood serum of the child with immunodeficiency?
A. Decreased IgA, IgM
B. Increased IgA, IgM
C. Decreased IgD, IgE
D. Increased IgD, IgE
E. No changes

14. A young woman, a foreign student from Tehran, has made an appointment with the urologist. She complains of the sensation of heaviness in her lower abdomen and a small amount of blood being excreted with urine at the end of each urination. Microscopy of urine detects the presence of parasite eggs, approximately 140x70 micron in size, with a terminal spike. What diagnosis can be made by an infectionist?
A. Schistosomiasis
B. Opisthorchiasis
C. Dicroceliasis
D. Paragonimiasis
E. Fascioliasis

15. Sanitary assessment of a pond, where the children from a recreation summer camp take their swims, detected oval cysts 50–60 micron in diameter, with 2 nuclei visible in their cytoplasm (macronucleus and micronucleus). What protozoa do these cysts belong to?
A. Balantidium
B. Lamblia
C. Toxoplasma
D. Amoeba
E. Euglena

16. A 40-year-old woman was diagnosed with glomerulonephritis based on her clinical symptoms and the results of urine analysis. Anamne-

sis states chronic tonsillitis. What microorganisms are the most likely cause for her kidney damage?

A. Streptococci
B. Staphylococci
C. Escherichia
D. Mycoplasma
E. Meningococci

17. A bacteriological laboratory has been investigating a sample of homemade dried fish that was the cause of severe food poisoning. Microscopy of the culture inoculated in Kitt-Tarozzi medium revealed microorganisms resembling a tennis racket. What diagnosis can be made?

A. Botulism
B. Salmonellosis
C. Cholera
D. Dysentery
E. Typhoid fever

18. Initial inoculation of water in 1% peptone water resulted in growth of a thin film on the medium surface in 6 hours. Such cultural properties are characteristic of causative agent of the following disease:

A. Cholera
B. Plague
C. Tuberculosis
D. Dysentery
E. Pseudotuberculosis

19. Stool culture test of a 6-month-old bottle fed baby revealed a strain of intestinal rod-shaped bacteria of antigen structure 0–111. What diagnosis can be made?

A. Colienteritis
B. Gastroenteritis
C. Choleriform disease
D. Food poisoning
E. Dysentery-like disease

20. A patient has been hospitalized with provisional diagnosis of virus B hepatitis. Serological reaction based on complementation of anti-

gen with antibody chemically bound to peroxidase or alkaline phosphatase was used for disease diagnostics. What is the name of the applied serological reaction?

A. Immune-enzyme analysis
B. Radioimmune assay
C. Immunofluorescence test
D. Bordet-Gengou test
E. Antigen-binding assay

21. A patient working at a pig farm complains of paroxysmal abdominal pain, liquid feces with mucus and blood, headache, weakness, fever. Examination of large intestine revealed ulcers from 1 mm up to several cm in diameter, feces contained oval unicellular organisms with cilia. What disease can be suspected?

A. Balantidiasis
B. Amebiasis
C. Toxoplasmosis
D. Lambliasis
E. Trichomoniasis

22. In one of Polessia regions there was an outbreak of helminthiasis manifested by cramps and facial edemas. The developed preventive measures in particular included a ban for eating infected pork even after heat processing. What helminthiasis was the case?

A. Trichinosis
B. Taeniarhynchosis
C. Teniasis
D. Echinococcosis
E. Alveococcosis

23. A man is suffering from diarrhea. In summer he spent his vacation in the south at the sea coast. Bacteria with the following properties were detected in his feces: gram-negative curved mobile monotrichous bacilli that do not produce spores or capsules. Bacilli are undemanding to nutrient medium but require alkaline reaction (pH 8.59.5). Described are the agents of the following enteric infection:

A. Cholera
B. Shigellosis
C. Typhoid fever

D. Colienteritis
E. Pseudotuberculosis

24. Impression smear of mucosa biopsy material has been obtained from a patient with peptic ulcer disease of the stomach. Gram-negative arcuate bent microorganisms were detected, urease activity test was positive. What microorganisms were detected in the patient?
A. Helicobacter
B. Spirochete
C. Spirilla
D. Leptospira
E. Treponema

25. A patient with probable liver abscess was delivered to a surgical department. The patient for a long time had been on an assignment in an African country and had recurrent cases of acute gastrointestinal disturbance. What protozoan disease can it be?
A. Amebiasis
B. Trypanosomiasis
C. Leishmaniasis
D. Malaria
E. Toxoplasmosis

26. Mass mortality of rodents was observed in one of the mountain villages. Simultaneously there occurred a disease outbreak in the local population. The disease manifested by rapidly progressive fever up to 40°C, marked intoxication, and enlargement of inguinal lymph nodes. Smear preparations made from autopsy specimens contained gram-negative ovoid bacilli with bipolar staining. What microorganism is the causative agent of this disease?
A. *Yersinia pestis*
B. *Staphylococcus*
C. *Francisella tularensis*
D. *Bacillus anthracis*
E. *Clostridia*

27. The disease onset occurred 3 days ago. The patient complains of body temperature up to 38°C, stomachache, and frequent loose bloody stools. Bacillary dysentery was clinically diagnosed in the patient. What method of

microbiological diagnostics would be advisable in this case and what samples should be obtained from the patient to confirm this diagnosis?

A. Bacteriology, feces
B. Bacterioscopy, feces
C. Bacterioscopy, blood
D. Bacteriology, urine
E. Serology, blood

28. Patients with similar complaints applied to the doctor: weakness, pain in the intestines, GIT disorder. Examination of the faeces revealed that one patient with four nucleus cysts should be hospitalized immediately. What protozoa are such cysts typical for?

A. Dysenteric amoeba
B. Intestinal amoeba
C. Balantidium
D. Trichomonas
E. Lamblia

29. A female patient consulted a physician about digestive disorder, extended abdominal pain. Examination revealed a drastic decrease in hemoglobin concentration. It is known from the anamnesis that while living in the Far East the patient used to eat freshly-salted caviar. Some relatives living with her had the similar condition. What is the most likely diagnosis?

A. Diphyllobothriasis
B. Echinococcosis
C. Teniasis
D. Trichiniasis
E. Ascaridiasis

30. Serological diagnostics of infectious diseases is based upon specific interaction with antigens. Specify the serological reaction that underlies adhesion of microorganisms when they are affected by specific antibodies in presence of an electrolyte:

A. Agglutination reaction
B. Precipitation reaction
C. Complement-binding reaction
D. Hemadsorption reaction
E. Neutralization reaction

31. In order to determine toxigenicity of diphtheria bacilli a strip of filter paper impregnated with antitoxic diphtherial serum was put on the dense nutrient medium. There were also inoculated a microbial culture under examination and a strain that is known to be toxigenic. If the microbial culture under examination produces exotoxin, this will result in formation of:

A. Precipitin lines
B. Haemolysis zones
C. Zones of diffuse opacification
D. Zones of lecithovitellinous activity
E. Precipitin ring

32. Examination of patients with periodontitis revealed the interdependence between the rate of affection of periodontal tissues and the number of lysozymes in saliva and gingival liquid. These results can be obtained during studying the following protection system of an organism:

A. Non-specific resistance
B. Humoral immunity
C. Cellular immunity
D. Autoresponsiveness
E. Tolerance

33. A patient complains of skin itch, especially between fingers, in the inguinal creases, on the lower abdomen. Examination of these regions revealed some small vesicles there. Laboratory diagnostics allowed to establish that this condition had been caused by a representative of Arthropoda. Specify the disease caused by this arthropod:

A. Scabies
B. Demodicosis
C. Myiasis
D. Pediculosis
E. Dermotropic leishmaniasis

34. A 71-year-old man had been presenting with diarrhea for 10 days. The feces had admixtures of blood and mucus. He was delivered to a hospital in grave condition and died 2 days later. Autopsy of the body revealed the following: diphtheritic colitis with multiple irregularly-shaped ulcers of different depth in both sigmoid colon and rectus. Bacteriological analysis revealed Shigella. What was the main disease?

A. Dysentery

B. Typhoid fever
C. Salmonellosis
D. Nonspecific ulcerous colitis
E. Yersiniosis

35. Examination of duodenal contents revealed some pyriform protozoa with twin nuclei and four pairs of flagella. There were two supporting filaments between the nuclei and a suctorial disc on the ventral side. What representative of protozoa was revealed in this patient?
A. Lamblia
B. Toxoplasma
C. Leishmania
D. Intestinal trichomonas
E. Trypanosome

36. Vomiting matters of a patient suspected of having cholera were delivered to the bacteriological laboratory. The material was used for preparing a "hanging drop" specimen. What type of microscopy will be applied for identification of the causative agent by its motility?
A. Phase-contrast microscopy
B. Electron microscopy
C. Immune and electron microscopy
D. Fluorescence microscopy
E. Immersion microscopy

37. A 4-year-old child presents with general weakness, sore throat and deglutitive problems. After his examination a doctor suspected diphtheria and sent the material to the bacteriological laboratory. In order to determine the diphtheria causative agent, the material should be inoculated into the following differential diagnostic medium:
A. Blood tellurite agar
B. Endo's agar
C. Ploskyrev's agar
D. Sabouraud's agar
E. Levenshtein-Yessen agar

38. During regular examination of schoolchildren it was revealed that a 10-year-old girl had asymmetric oval eggs with a larva in the scrape from her perianal folds. What diagnosis should be made?

A. Enterobiasis
B. Ascariasis
C. Amebiasis
D. Trichocephalosis
E. Ankylostomiasis

39. Researchers of a bacteriological laboratory examine tinned meat for botulinum toxin. For this purpose, a group of mice was injected with an extract of the material under examination and antitoxic antibotulinum serum of A, B, E types. A control group of mice was injected with the same extract but without antibotulinum serum. What serological reaction was applied?
A. Neutralization
B. Precipitation
C. Complement binding
D. Opsonocytophagic
E. Double immune diffusion

40. During the repeated Widal's agglutination test it was noticed that the ratio of antibody titers and O-antigens *S. typhi* in the patient's serum had increased from 1:100 to 1:400. How would you interpret these results?
A. The patient has typhoid fever
B. The patient is an acute carrier of typhoid microbes
C. The patient is a chronic carrier of typhoid microbes
D. The patient previously had typhoid fever
E. The patient was previously vaccinated against typhoid fever

**Exercise 3. Translate the word-combinations into Ukrainian.**

To specify the most correct etiological name, an outbreak of hepatitis, provisionally diagnosed with typhoid fever, sputum smears, staining technique, oval eggs covered with lumpy capsules, a thin film on the medium surface, infested pork, gram-negative curved mobile monotrichous bacilli, arcuate bent microorganisms, mass mortality of rodents, immune-enzyme assay, liquid feces with mucus and blood, pyriform protozoa with twin nuclei, four pairs of flagella, the scrape from the perianal folds, a strain of intestinal rod-shaped bacteria, to give birth to a stillborn baby, gram-negative ovoid bacilli with bipolar staining, filter paper impregnated with antitoxic diphtherial serum, a suctorial disc on the ventral side, identification of the causative agent by its motility.

**Exercise 4. Match the terms to the definitions.**

**Basic Infectiological Terminology (Pathogen)**

| Term | Explanation |
|---|---|
| a) Saprophytes | 1) Classic disease-causing pathogens |
| b) Parasites | 2) Smallest number of pathogens sufficient to cause an infection |
| c) Commensals | 3) Can cause disease in immune-compromised individuals; these are frequently germs of the normal flora or occasionally from the surrounding environment, animals, or other germ carriers |
| d) Pathogenic microorganisms | 4) Unicellular or metazoan organism living in or on an organism of another species (host) on the expense of the host<br>Classic disease-causing pathogens |
| e) Opportunists or facultatively pathogenic microorganisms | 5) Normal inhabitants of skin and mucosa; the normal flora is thus the total commensal population |
| f) Pathogenicity | 6) The totality of host species “susceptible” to infection by a given pathogen |
| g) Virulence | 7) Method or pathway used by pathogen to invade host |
| h) Incubation period | 8) A parasitological term: time between infection and first appearance of products of sexual reproduction of the pathogen (e. g., worm eggs in stool of a host with helminthosis) |
| i) Prepatency | 9) Sum of the disease-causing properties of a strain of a pathogenic species |
| j) Infection spectrum | 10) Time between infection and manifestation of disease symptoms; this specific disease characteristic can be measured in hours, days, weeks, or even years |
| k) Minimum infective dose | 11) These microorganisms are nonpathogenic; their natural habitat is dead organic matter |
| l) Mode of infection | 12) Capacity of a pathogen species to cause disease |

**Exercise 5. Match the diseases to the causative agents (or the type of infectious agents).**

| | |
|---|---|
| Anthrax | *Shigella* or *Entamoeba histolytica* |
| Plague | *Streptococcus pyogenus* |
| Cholera | *Bacillus* |
| Typhoid fever | *Clostridium* |
| Leprosy | *Yersinia pestis* |
| Dysentery | *Salmonella enterica* |
| Scarlet fever | *Plasmodium* |
| Botulism | *Treponema pallidum* |
| Malaria | *Virus* |
| Syphilis | *Vibrio* |
| Mumps | *Mycobacterium* |

**Exercise 6. Complete each sentence with the correct ending from box B**

| A | B |
|---|---|
| 1) Mycobacteria are slender rod bacteria that are stained … | a) … remain clinically silent. |
| 2) Ninety percent of primary infection foci … | b) … on the skin, mucosa, and peripheral nerves. |
| 3) Humans show a considerable degree … | c) … atypical mycobacteria (old designation), nontuberculous mycobacteria (NTM) or MOTT (mycobacteria other than tubercle bacilli). |
| 4) Diagnosis requires microscopic and cultural identification … | d) … with special differential stains (Ziehl-Neelsen). |
| 5) Leprosy is manifested mainly … | e) … of genetically determined resistance to TB. |
| 6) Mycobacteria that are neither tuberculosis nor leprosy bacteria are categorized as … | f) … a purulent conjunctivitis, seen mainly in newborn children. |

| | |
|---|---|
| 7) Gonococci are Gram-negative, coffee-bean-shaped cocci … | g) of the pathogen or pathogen-specific DNA. |
| 8) Gonococci reaching the conjunctival membrane may cause … | h) … by smear infection or indirectly via food and drinking water. |
| 9) Species with many flagella (e. g., Proteus species) show motility … | i) that are usually paired and have a diameter of approximately 1 lm. |
| 10) Transmission is either direct … | j) … on the agar surface. |

**Exercise 7. Fill in the gaps with correct Plural/Singular forms.**

| Singular | Plural |
|---|---|
| | bacteria |
| bacillus | |
| (culture) medium | |
| alga | |
| | species |
| spirillum | |
| nucleus | |
| | cocci |
| | chlamydiae |
| analysis | |
| | rickettsiae |
| focus | |
| flagellum | |
| | fungi |
| | cilia |
| mitochondrion | |
| clostridium | |

**Exercise 8. Match the words with the similar meaning.**

| | |
|---|---|
| specimen | analysis |
| curved | swallowing |
| assay | bacilliform |
| impregnate | sample |
| motility | identify |
| rod-shaped | egg-shaped |
| filament | bent |
| specify | soak |
| ovoid | crease |
| fold | fiber |
| deglutition | mobility |

**Exercise 9. Read the text below. Use the word given in brackets to form a word that fits in the gap.**

**Specific Immune Defenses**

The specific, adaptive … (immunity) defenses include both the humoral system (antibody — … (produce) B cells) and the cellular system (T helper cells and … (cytotoxicity) T lymphocytes). In general, viruses the antigens of which are expressed on the surface of the … (infection) cells tend to induce a cellular immune response and viruses that do not change the … (antigen) of their host cells tend to …(activation) the humoral system.

**Humoral immunity.** Antibodies can only attack viruses outside of their host cells, which means that once an infection is … (establishment) within an organ it can hardly be further influenced by antibodies, since the viruses spread … (direct) from cell to cell. In principle, the humoral immune system is thus only capable of … (prevent) a … (general) infection, but only if the antibodies are … (presence) at an early stage (e. g., induced by … (vaccinate). Class IgG and IgM antibodies are active in the bloodstream and class IgA is active on the mucosal surface. The … (effectiveness) of the antibodies on the viral particles ("neutralization") is based on steric hindrance of virus adsorption to the host cells by the antibodies … (attachment) to their surfaces. The … (neutralize) effect of antibodies is strongest when they react with the receptor-binding sites on the capsids so

as to block them, rendering the virus … (incapability) of combining with the cellular receptors.

**Cellular immunity.** This type of immune … (defend) is far more important when it comes to fighting viral infections. T lymphocytes (killer cells) recognize virus — … (infectious) cells by the viral antigens on their surfaces and … (destruction) them. The … (observe) that patients with defective humoral … (immune) generally fare better with virus infections than those with a defective cellular … (responsibility) underlines the fact that the cellular immune defense system is the more … (importance) of the two.

**Exercise 10. Fill in the table**

| Noun | Adjective | Verb |
|---|---|---|
| curve | curved | |
| | inoculative | |
| cause | | |
| infestation | | |
| | | deepen |
| | | recur |
| | impregnated | |
| specification | | |
| | | immunize |

**Exercise 11. Say which words/terminological phrases are defined below.**

1) … — piece of dead tissue that is cast off from the surface of the skin, particularly after a burn injury, but also seen in gangrene, ulcer, fungal infections, necrotizing spider bite wounds, tick bites associated with spotted fevers, and exposure to cutaneous anthrax.

2) … — a lack or shortage; a condition characterized by the presence of less than the normal or necessary supply or competence.

3) … — the immune response of the recipient to foreign tissue cells (antigens) after homograft transplantation, with the production of antibodies and ultimate destruction of the transplanted organ.

4) … — potentially life-threatening invasion of the bloodstream by pathogenic agents and especially bacteria along with their toxins from a localized infection (as of the lungs or skin) that is accompanied by acute systemic illness.

5) … — a subset of sepsis in which particularly profound circulatory, cellular, and metabolic abnormalities are associated with a greater risk of mortality than with sepsis alone.

6) … — damage to the skin or other body parts caused by extreme heat, flame, contact with heated objects, or chemicals.

7) … — the ability of bacteria and other microorganisms to withstand a drug that once stalled them or killed them.

8) … — a practical method used to describe the level of consciousness in a person following a traumatic brain injury.

# Chapter II

**Exercise 1. Key words**

| Nouns | Verbs | Adjectives | Adverbs |
|---|---|---|---|
| bean-shaped | accompany | caseous | closely |
| broth | discharge | clublike | predominantly |
| bug | establish | convoluted | presumably |
| coil | gemmate | crescent-shaped | radially |
| dormancy | moisten | elongated | slightly |
| fly | presume | fusiform | |
| inoculum | resemble | nuchal | |
| refuse | underly | pointed | |
| scraping | | porrect | |
| sediment | | strip-like | |
| thickening | | undulating | |
| tick | | vermiform | |
| turbidity | | | |

**Exercise 2. Read the test.**

1. 48 hours after tuberculin test (Mantoux test) a child had a papule 10 mm in diameter on the spot of tuberculin injection. What hypersensitivity mechanism underlies these changes?

A. Cellular cytotoxicity
B. Anaphylaxis
C. Antibody-dependent cytotoxicity
D. Immunocomplex cytotoxicity
E. Granulomatosis

2. A patient has been suffering from diarrhea for 5 days. On the fifth day, colonoscopy revealed that the membrane of the rectum was inflamed; there were greyish-green films closely adhering to the subjacent tissue. What is the most probable diagnosis?

A. Dysentery
B. Typhoid fever
C. Nonspecific ulcerative colitis
D. Salmonellosis
E. Crohn's disease

3. A patient has acne on his face. Microscopic examination of scrapings from the affected areas revealed living porrect (extending horizontally) vermiform arthropods 0.2–0.5 mm large with four pairs of short extremities in the front part of their bodies. What is the laboratory diagnosis?
A. Demodicosis
B. Scabies
C. Myiasis
D. Pediculosis
E. Phthiriasis

4. A patient had been suffering from elevated temperature and attacks of typical cough for 10 days. Doctor administered an inoculation of mucus from the patient's nasopharynx on the agar. What microorganism is presumed?
A. Pertussis bacillus
B. Pfeiffer's bacillus
C. Listeria
D. Klebsiella
E. Staphylococcus

5. A bacteriological laboratory received a sputum sample of a patient suffering from tuberculosis. Bacterioscopic examination of smears and detection of tuberculosis bacillus can be realized by one of enrichment methods that involves processing of sputum only with solution of caustic soda. What is this method called?
A. Homogenization
B. Inactivation
C. Flotation
D. Filtration
E. Neutralization

6. A patient had been suffering from profuse diarrhea and vomiting for 2 days. He died from acute dehydration. Autopsy revealed that the intestinal wall was edematous and hyperemic, with multiple haemorrhages in the

mucous membrane. Intestinal lumen contains whitish fluid resembling rice water. What disease caused the death?

A. Cholera
B. Dysentery
C. Salmonellosis
D. Typhoid fever
E. Enterocolitis

7. Material taken from a patient with a provisional diagnosis of influenza was referred to a laboratory. The hemadsorption reaction was applied for the virological examination. This reaction can be applied for detection of the following viruses:

A. Viruses containing hemagglutinins
B. All the simple viruses
C. All the complex viruses
D. DNA-genomic viruses
E. Any viruses

8. A 23-year-old man has perforation of the hard palate. In the area of this perforation there was a compact well-defined formation. Microscopic examination of the resected formation revealed a large focus of caseous necrosis surrounded by granulation tissue with endovasculitis, cellular infiltration composed of lymphocytes, epithelioid cells (mainly plasmocytes). What is the most probable diagnosis?

A. Syphilis
B. Tuberculosis
C. Scleroma
D. Sarcoma
E. Leprosy

9. After inoculation of investigated material (feces) on 1% alkaline peptone water and 8-hour-long incubation in the thermostat under 37°C, the growth of a pale bluish film is observed. Such cultural properties are characteristic of the agent of the following disease:

A. Cholera
B. Plague
C. Typhoid fever
D. Paratyphoid A fever
E. Dysentery

10. Examination of a patient with pustular skin lesions allowed to isolate a causative agent that forms in the blood agar roundish yellow middle-sized colonies surrounded by a haemolysis zone. Smears from the colonies contain irregular shaped clusters of gram-positive cocci. The culture is oxidase- and catalase-positive, ferments mannitol and synthesizes plasmocoagulase. What causative agent was isolated?

A. *Staphylococcus aureus*
B. *Streptococcus agalactiae*
C. *Streptococcus pyogenes*
D. *Staphylococcus epidermidis*
E. *Staphylococcus saprophyticus*

11. Microscopic examination of a Gram-stained scrape from patient's tongue revealed oval, round, elongated chains of dark-violet gemmating cells. What disease can be caused by this causative agent?

A. Candidosis
B. Actinomycosis
C. Streptococcal infection
D. Staphylococcal infection
E. Diphtheria

12. The blood of a patient with presumable sepsis was inoculated into sugar broth. There appeared bottom sediment. Repeated inoculation into blood agar caused the growth of small transparent round colonies surrounded by a hemolysis zone. Examination of a smear from the sediment revealed gram-positive cocci in the form of long chains. What microorganisms are present in the blood of this patient?

A. Streptococci
B. Micrococci
C. Staphylococci
D. Tetracocci
E. Sarcina

13. In order to estimate the toxigenicity of diphtheria agents obtained from patients, the cultures were inoculated on a Petri dish with nutrient agar on either side of a filter paper strip that was put into the centre and moistened with antidiphtheric antitoxic serum. After incubation of the inoculation in agar, the strip-like areas of medium turbidity were found be-

tween separate cultures and the strip of filter paper. What immunological reaction was conducted?

A. Precipitation gel reaction
B. Coomb's test
C. Agglutination reaction
D. Rings precipitation reaction
E. Opsonization reaction

14. A patient with clinical signs of encephalitis was delivered to the infectious diseases' hospital. Anamnesis registered a tick bite. Hemagglutination-inhibition reaction helped to reveal antibodies to the causative agent of tick-borne encephalitis in the dilution 1:20, which is not diagnostic. What actions should the doctor take after he had got such a result?

A. To repeat the examination with serum taken 10 days later
B. To examine the same serum
C. To apply more sensitive reaction
D. To repeat examination with another diagnosticum
E. To deny diagnosis of tick-borne encephalitis

15. A culture of monkey cells (Vero) and a group of suckling mice were infected with an inoculum taken from a child with provisional diagnosis "enterovirus infection". There was no cytopathic effect on the cell culture but suckling mice died. What enteric viruses might have caused the disease in this child?

A. Coxsackie A
B. Coxsackie B
C. ECHO virus
D. Polioviruses
E Unclassified enteric viruses 68–71

16. A patient of the surgical department complains of pain in the small of her back and in the lower part of her belly, painful and frequent urination. Bacteriological examination of the urine revealed gram-negative oxidase-positive rod-shaped bacteria forming greenish mucoid colonies with specific smell. What causative agent can it be?

A. *Pseudomonas aeruginosa*
B. *Proteus mirabilis*
C. *E. coli*

D. *Str. pyogenes*
E. *Mycoplasma pneumonie*

17. A gynaecologist was examining a patient and revealed symptoms of genital tract inflammation. A smear from the vagina contains pyriform protozoa with a spine and flagella at their front; there is also an undulating membrane. What disease can be suspected?
A. Urogenital trichomoniasis
B. Lambliasis
C. Intestinal trichomoniasis
D. Toxoplasmosis
E. Balantidiasis

18. Inoculum from the pharynx of a patient suffering from quinsy was inoculated into blood-tellurite agar. It resulted in the growth of grey, radially striated (in form of rosettes) colonies 4–5 mm in diameter. Gram-positive bacilli with club-like thickenings on their ends placed in the form of spread wide apart fingers are visible on microscope. What microorganisms are there?
A. Diphtheria corynebacteria
B. Botulism clostridia
C. Diphtheroids
D. Streptococci
E. Streptobacilli

19. Analysis of the cerebrospinal fluid of a child with signs of purulent lesion of brain tunics revealed gram-negative bean-shaped diplococci. What presumptive diagnosis can be made on the basis of the analysis results?
A. Meningitis
B. Gonorrhea
C. Cholera
D. Plague
E. Anthrax

20. It is necessary to carry out preventive vaccination of a student group because of an occurrence of diphtheria. Which preparation should be used for the creation of artificial active immunity?
A. DTP vaccine

B. Specific immunoglobulin
C. Diphtheria toxoid
D. Inactivated bacteria vaccine
E. Anti-diphtheria serum

21. From the nasopharynx of a 5-year-old child it was excreted a microorganism which is identical to *Corynebacterium diphtheriae* according to morphological and biochemical signs. Microorganism does not produce exotoxin. As a result of what process can this microorganism become toxigenic?
A. Phage conversion
B. Cultivation in the telluric environment
C. Passing through the organism of the sensitive animals
D. Growing with antitoxic serum
E. Chromosome mutation

22. The organisms to be identified have a nucleus surrounded by a nuclear membrane. Genetic material is concentrated predominantly in the chromosomes which consist of DNA strands and protein molecules. These cells divide mitotically. Identify these organisms:
A. Eukaryotes
B. Bacteriophages
C. Prokaryotes
D. Viruses
E. Bacteria

23. A child is presumably ill with diphtheria. A specimen of the affected mucous membrane of his pharynx was taken for analysis. The smear was stained and microscopic examination revealed yellow rods with dark blue thickenings on their ends. What structural element of a germ cell was revealed in the detected microorganisms?
A. Volutin granules
B. Plasmids
C. Capsule
D. Spores
E. Flagella

24. There are several cases of children from boarding school suffering from sore throat. Microscopy of tonsil smears stained according to the

Neisser method has revealed thin yellow bacilli with dark brown grains on their ends placed in the shape of Roman numeral five. What infection can be suspected in this case?

A. Diphtheria
B. Infectious mononucleosis
C. Listeriosis
D. Tonsillitis
E. Scarlet fever

25. A patient had been suspected pneumonia. In his sputum there were revealed gram-positive diplococci, prolonged with the slightly pointed opposite ends. What microorganisms were revealed in the sputum?

A. *Staphylococcus aureus*
B. *Neisseria gonorrhoeae*
C. *Neisseria meningitidis*
D. *Klebsiella pneumonia*
E. *Streptococcus pneumonia*

26. Gram-negative bean-shaped diplococci inside and outside of leucocytes were detected on bacteriological examination of the purulent exudates from the cervix of the uterus. Name the causative agent of purulent inflammation of the uterus cervix.

A. *Neisseria gonorrhoeae*
B. *Chlamydia trachomatis*
C. *Calymmatobacterium granulomatis*
D. *Haemophilus vaginalis*
E. *Trichomonas vaginalis*

27. While studying blood and mucus samples from the nasopharynx, a bacteriologist took certain measures to preserve the pathogens in the material. Bacterioscopic study revealed the presence of gram-negative cocci looking like coffee beans and arranged in pairs or tetrads. Name the pathogen that was isolated by the bacteriologist:

A. *Neisseria meningitidis*
B. *Staphylococcus aureus*
C. *Neisseria gonorrhoeae*
D. *Moraxella lacunata*
E. *Acinetobacter calcoaceticus*

28. A 34-year-old male patient consulted a doctor about face carbuncle. Objectively: a loose, painless edema of hypodermic tissue; black crust in the center of carbuncle, vesicular rash around it. Microbiological examination revealed static streptobacilli capable of capsule building. What microorganisms are the causative agents of this disease?

A. *Bacillus anthracis*
B. *Staphylococcus aureus*
C. *Bacillus subtilis*
D. *Bacillus anthracoideus*
E. *Bacillus megaterius*

29. Autopsy of the body of a 40-year-old patient detected enlarged grouped follicles in the small intestine. Their surface has ridges and fissures arranged in a pattern that resembles gyri and sulci of the brain. The follicles protrude above the surface of the intestinal mucosa. On section, they are gray-red and juicy. Microscopy shows proliferation of monocytes, histiocytes, and giant cells. There are clusters of lymphocytes, and the follicles are depleted. What disease can be characterized by these changes?

A. Shigellosis
B. Cholera
C. Amebiasis
D. Salmonellosis
E. Actinomycosis

30. A man died from an acute infectious disease accompanied by fever, jaundice, haemorrhagic rash on the skin and mucous membranes as well as by acute renal insufficiency. Histological examination of renal tissue (stained by Romanovsky-Giemsa method) revealed some convoluted bacteria looking like C and S letters. What bacteria were revealed?

A. Leptospira
B. Treponema
C. Spirilla
D. Borrelia
E. Campilobacteria

31. The laboratory for especially dangerous infections conducts the microscopic examination of pathological material from a patient with suspected plague. The sample has been stained by Burri-Gins technique. What property of the causative agent can be identified by this technique?

A. Capsule formation
B. Spore formation
C. Acid resistance
D. Alkali resistance
E. Presence of volutin granules

32. Microscopy of dental plaque revealed unicellular organisms. Their cytoplasm had two distinct layers, barely visible core, wide pseudopodia. The patient is most likely to have:
A. *Entamoeba gingivalis*
B. *Entamoeba histolytica*
C. *Trichomonas tenax*
D. *Lamblia*
E. *Entamoeba coli*

33. A puncture sample taken from the lymph node of a patient with preliminary diagnosis of protozoan disease has been investigated. The preparation was processed with Giemsa stain technique and the following was detected: crescent-shaped bodies with pointed tips, blue cytoplasm and red nuclei. What protozoa have been detected in the preparation?
A. *Toxoplasma*
B. *Plasmodium malariae*
C. *Trypanosoma*
D. Viscerotropic species of *Leishmania*
E. Dermatotropic species of *Leishmania*

34. A three-year-old child has had marked diarrhea for three days. Immune electron microscopy of his excrements revealed bilayer pseudocovered capsid viruses that looked like small spoke wheels. What viruses have been revealed?
A. Rotaviruses
B. Coxsackie viruses
C. ECHO viruses
D. Coronaviruses
E. Reoviruses

35. A 32-year-old patient who lives in the countryside consulted a doctor about a painful swelling and a fistula in the submandibular region. Examination revealed an infiltration with a fistula discharging thick pus and containing white granules. On dissection the infiltration tissues turned out to be dense, yellow-green and had honeycomb structure because of multiple abscesses. What is the most likely diagnosis?

A. Actinomycosis
B. Tuberculosis
C. Lepra
D. Syphilis
E. Submandibular abscess

36. The sterile Petri dishes and pipettes are necessary to prepare for microbiological tests in a bacteriological laboratory. What way of sterilization should be applied in this case?

A. Dry-heat sterilization
B. Tyndallization
C. Pasteurization
D. Boiling
E. Steam sterilization in autoclave

37. In the surgical ward, the dressing material was undergoing sterilization in an autoclave. Through an oversight of a nurse the mode of sterilization was changed and the temperature in the autoclave reached only 100°C instead of the due 120° C. What microorganisms can stay viable under these conditions?

A. Bacilli and clostridia
B. Staphylococci and streptococci
C. Mold and yeast fung
D. Salmonella and klebsiella
E. Corynebacteria and mycobacteria

38. Microscopy of smear preparation stained with methylene blue revealed bacilli with clublike expansions on their ends similar to *C. diphtheriae*. What additional method of staining should be used to verify this assumption?

A. Neisser
B. Kozlovsky

C. Ziehl-Neelsen
D. Zdrodowsky
E. Aujeszky

39. Microscopic study of discharges from urethra of a patient suffering from acute urethritis revealed bean-shaped microorganisms up to 1 micrometer in diameter arranged in pairs and placed inside the leukocytes. What microorganisms are there?

A. Gonococci
B. Meningococci
C. Tetracocci
D. Streptococci
E. Staphylococci

40. A young woman suddenly developed a fever up to 39°C accompanied by a strong headache. Examination revealed marked nuchal rigidity. Spinal puncture was performed. Gram-stained smear of cerebrospinal fluid contained many neutrophils and Gram-negative diplococci. What bacteria could be the cause of this disease?

A. *Neisseria meningitidis*
B. *Streptococcus pneumoniae*
C. *Haemophilus influenza*
D. *Staphylococcus aureus*
E. *Pseudomonas aeruginosa*

**Exercise 3. Translate the word-combinations into Ukrainian.**

Microscopic examination of scrapings, living porrect vermiform arthropoda, fusiform sporeforming microorganisms, a large focus of caseous necrosis, elongated chains of dark-violet gemmating cells, moistened with antidiphtheric antitoxic serum, inoculated into sugar broth, a smear from the sediment, the strip-like areas of medium turbidity, old burial ground for animal refuse, the causative agent of tick-borne encephalitis, an undulating membrane, grampositive bacilli with clublike thickenings on their ends, a prolonged period of dormancy, blue bacilli with a thickening at the poles, crescent-shaped bodies with pointed tips, gram-negative bean-shaped diplococcus, mobile convoluted microorganisms, marked nuchal rigidity, halfmoon-shaped unicellular organisms with pointed ends.

**Exercise 4. Match the terms to the definitions**
***Basic Infectiological Terminology (Host)***

| Term | Explanation |
|---|---|
| a) Contamination | 1) Infection arising from invasion of host by micro-organisms from sources external to it |
| b) Colonization | 2) Infection that remains restricted to the portal of entry and surrounding area |
| c) Infection | 3) Brief presence of microorganisms in the blood-stream |
| d) Inapparent (or subclinical) infection | 4) Lymphogenous and/or hematogenous spread of invading pathogen starting from the portal of entry; infection of organs to which pathogen shows a specific affinity (organotropism); three stages: incubation, generalization, organ manifestation |
| e) Infectious disease (or clinical infection) | 5) Occurrence of a second infection in the course of a first infection |
| f) Probability of manifestation | 6) Series of infections by different pathogens |
| g) Endogenous infection | 7) Series of infections by the same pathogen |
| h) Exogenous infection | 8) Frequency of clinical manifestation of an infection in disposed individuals (%) |
| i) Nosocomial infection | 9) Infection acquired during hospitalization (urinary tract infections, infections of the respiratory organs, wound infection, sepsis) |
| j) Local infection | 10) Infection arising from the colonizing flora |
| k) Generalized infection<br>l) | 11) Infection without outbreak of clinical symptoms |

| | |
|---|---|
| m) Sepsis | 12) Systemic disease caused by microorganisms and/or their toxic products; there is often a localized focus of infection from which pathogens or toxic products enter the bloodstream continuously or in intermittent phases |
| n) Transitory bacteremia/viremia/parasitemia | 13) Infection with outbreak of clinical symptoms |
| o) Superinfection | 14) Presence of microorganisms on skin or mucosa; no penetration into tissues; typical of normal flora; pathogenic microorganisms occasionally also show colonization behavior |
| p) Relapses | 15) Invasion of a host organism by microorganisms, proliferation of the invading organisms, and host reaction |
| q) Reinfection | 16) Microbiological presence of microorganisms on objects, in the environment, or in samples for analysis |

**Exercise 5. Give the synonyms to the terms and expressions below (you may use the words in brackets below)**

hospital-acquired infection (HAI)
asymptomatic infections
trematodes
nematodes
cestodes
patients with weakened immune system
debilitated patients
direct contact infection
epidemic parotitis
Hansen's disease (HD)
pertussis

(immune-compromised patients, whooping cough, roundworms, weakened patients, leprosy, nosocomial infection, subclinical infection, flatworms, smear infection, tapeworms, mumps)

**Exercise 6. Match the diseases to the vector of the causative agent, its common name, and morphology of the corresponding parasitic arthropods.**

| Disease | Vector of the causative agent | Common name | Morphology |
|---|---|---|---|
| Lyme borreliosis and "early summer meningoencephalitis" | *Sarcoptes scabiei* | Lice (*sing.* – louse) | About 0.2–0.5 mm long with ovoid bodies. The adults and nymphs have four pairs of legs, the larva has three pairs of legs. Following transmission to a human host a female penetrates into the epidermis and begins to tunnel |
| Scabies | *Anoplura* | Ticks | Dorsoventrally flattened insects, about 1.5–4 mm in length, wingless, with reduced eyes, short (five-segmented) antennae, piercing and sucking mouthparts, and strong claws designed to cling to hairs |
| Pediculosis and phthiriosis | Ixodes | Mites | Male: about 2–3 mm long with a highly chitinized scutum covering the entire dorsal surface. Female: 3–4 mm, up to 12 mm when fully engorged after a blood meal; the scutum covers only the anterior portion of the body. Adults and nymphs (the latter about 1 mm long) have four pairs of legs, the smaller larvae (about 0.5 mm long) only three pairs. Possess characteristic piercing mouthparts. |

**Exercise 7. Match the words with the similar meaning.**

| | |
|---|---|
| vermiform | halfmoon-shaped |
| sediment | wavy |
| porrect | cloudiness |
| rigidity | worm-like |
| undulating | precipitate |
| turbidity | curettage |
| crescent-shaped | resembling |
| predominantly | extended forwards |
| scraping | mostly |
| similar | stiffness |

**Exercise 8. Fill in the table.**

| Noun | Adjective |
|---|---|
| | elongated |
| suppuration | |
| rigidity | |
| cause | |
| culture | |
| | immobile |
| | capable |
| | severe |

**Exercise 9. Write the sentences in the Passive.**

1) In 1890 the German physician and bacteriologist Robert Koch formulated four criteria for establishing a causative relationship between a microbe and a disease.

2) In active immunization, administration of vaccines stimulates the immune system to develop a disease-specific immunity.

3) The term asepsis covers all measures aiming to prevent contamination of objects or wounds.

4) The temperature coefficient describes the influence of temperature on the effectiveness of chemical agents.

5) Laboratory analysis detected oval eggs covered with lumpy capsules in the patient's feces.

6) Manufactures should use Ascoli's thermo precipitation test to examine the raw leather for presence of B. anthracis.

7) What protozoan disease could cause intrauterine death?

8) Immunological processes can also influence the course of viral infections.

**Exercise 10. Fill in the gaps with the words given in the box.**

| photosynthetic pigments, species, defenses, parasitic, eukaryotes, transformation, arthropods, mitochondria |
|---|

**Fungi and Protozoa**

**Fungi.** Fungi (Mycophyta) are nonmotile … with rigid cell walls and a classic cell nucleus. They contain no … and are carbon heterotrophic, that is, they utilize various organic nutrient substrates (in contrast to carbon autotrophic plants). Of more than 50 000 fungal …, only about 300 are known to be human pathogens. Most fungal infections occur as a result of weakened host immune … .

**Protozoa.** Protozoa are microorganisms in various sizes and forms that may be free-living or …. They possess a nucleus containing chromosomes and organelles such as … (lacking in some cases), an endoplasmic reticulum, pseudopods, flagella, cilia, kinetoplasts, etc. Many parasitic protozoa are transmitted by …, whereby multiplication and … into the infectious stage take place in the vector.

**Exercise 11.**

**a) Make nouns from adjectives.**

Drowsy, urgent, vulnerable, compliant, immunosuppressive, likely, effective, severe, responsible.

**b) Make verbs from nouns and adjectives.**

Threat**,** local, strength, worse, weak, trauma, metabolism, vaccine, neutral, red.

**c) Make nouns from verbs.**

Describe, alter, prevent, invade, injure, expose, incise, reject, manage, perceive.

# *UNIT 9*
# PHARMACOLOGY

## Chapter I

**Exercise 1. Key words.**

| Nouns | Verbs | Adjectives | Adverbs |
|---|---|---|---|
| admission | determine | acute | preliminarily |
| case | develop | antiinflammatory | several |
| dizziness | enhance | appropriate | |
| drug | fail | close | |
| inhibition | force | evident | |
| introduction | improve | general | |
| mucosa | include | impaired | |
| output | prescribe | indistinct | |
| resection | receive | laxative | |
| spot | reveal | mucolytic | |
| thirst | suffer from | mucosal | |
| tunic | suppress | | |
| vision | use | | |

**Exercise 2. Read the tests.**

1. A woman with seasonal vasomotor rhinitis, who works as a train dispatcher and is an outpatient, should be prescribed an antihistaminic drug that does not suppress the central nervous system. Name this drug:

A. Loratadine
B. Dimedrol (Diphenhydramine)
C. Diprazine (Promethazine)
D. Suprastin (Chloropyramine)
E. Tavegyl (Clemastine)

2. A pregnant woman with several miscarriages in her anamnesis is prescribed a therapy that includes vitamin preparations. What vitamin facilitates carrying a pregnancy?

A. Alpha-tocopherol
B. Folic acid
C. Cyanocobalamin
D. Pyridoxal phosphate
E. Rutin

3. During treatment with bismuth preparations a patient with syphilis developed gray spots on his oral mucosa and nephropathy symptoms. What drug is used as an antidote to bismuth preparations poisoning?

A. Unithiol
B. Nalorphine
C. Bemegride
D. Naloxone
E. Methylene blue

4. On the 2–3 day after the gastric resection the patient's intestinal peristalsis failed to restore. What should the patient be prescribed to stimulate the function of his gastrointestinal tract?

A. Proserin
B. Platyphylline
C. Cyclodol (Trihexyphenidyl)
D. Atropine
E. Dithylinum (Suxamethonium chloride)

5. A man came into the admission room with complaints of edemas, rapid heart rate, dyspnea, and cyanotic mucosal tunics. He was diagnosed with chronic heart failure. What drug should be prescribed to improve the patient's general state?

A. Digoxin
B. Papaverine hydrochloride
C. Mesaton (Phenylephrine)
D. Cordiamin
E. Nitroglycerine

6. A patient complaining of dizziness, thirst, difficult swallowing, and impaired vision of close objects has addressed a doctor. Objectively: respira-

tory rate is increased, pupils are dilated, general agitation, talkativeness, though the speech is indistinct. BP is 110/70 mm Hg, heart rate is 110/min. Given symptoms can indicate overdosage of the following drug:

A. Atropine
B. Morphine
C. Ephedrine
D. Aminazine
E. Caffeine

7. Due to prolonged taking of a drug the patient can develop osteoporosis, gastric mucosal erosions, hypokalemia, sodium and water retention, and decreased blood content of corticotropin. Specify this drug:

A. Prednisolone
B. Hydrochlorothiazide
C. Digoxin
D. Indometacin
E. Reserpine

8. A woman with polyarticular rheumatoid arthritis was prescribed a non-steroidal antiinflammatory drug — diclofenac sodium. After the patient had been taking it for some time, her concomitant disease exacerbated, which forced the doctor to cancel the prescription of this drug. What concomitant disease could necessitate cancellation of this drug prescription?

A. Ulcer disease
B. Ischemic heart disease
C. Diabetes mellitus
D. Essential hypertension
E. Bronchial asthma

9. During regular check-up a child is determined to have interrupted mineralization of the bones. What vitamin deficiency can be the cause?

A. Calciferol
B. Riboflavin
C. Tocopherol
D. Folic acid
E. Cobalamin

10. A 46-year-old patient suffering from ulcer disease of the stomach is diagnosed with rheumatoid arthritis. What antiinflammatory drug would be most advisable in this case?

A. Celecoxib

B. Prednisolone
C. Analgin (Metamizole)
D. Promedol (Trimeperidine)
E. Paracetamol

11. A patient suffers from acute cardiopulmonary failure with pulmonary edema. What diuretic should be prescribed in the given case?
A. Furosemide
B. Triamterene
C. Spironolactone
D. Dichlothiazidum (Hydrochlorothiazide)
E. Diacarb (Acetazolamide)

12. Therapeutic unit of a hospital received a man suffering from ulcer disease of the stomach with hyperacidity. Which of the listed groups of drugs must be used as a part of the complex therapy of this patient?
A. Histamine $H_2$-receptor antagonists
B. Calcium channel blockers
C. Nonsteroidal antiinflammatory drugs
D. Steroidal antiinflammatory drugs
E. Histamine $H_1$-receptor antagonists

13. During gastric resection the patient received mixed anesthesia with tubocurarine chloride muscle relaxant; to restore spontaneous respiration the patient received proserin. What pharmacological group does this drug belong to?
A. Cholinesterase inhibitors
B. Angiotensin-converting-enzyme inhibitors
C. Calcium channel blockers
D. Muscarinic antagonists
E. Muscarinic agonists

14. To treat bronchitis the patient was prescribed a beta-lactam antibiotic. Its mechanism of action is based on inhibition of murein production, which results in death of the causative agent. Name this drug:
A. Penicillin G Sodium Salt
B. Bijochinol (Quinine bismuth iodide)
C. Ciprofloxacin
D. Azithromycin
E. Streptomycin

15. A 38-year-old woman developed a bronchial asthma attack. Which of the listed bronchial spasmolytics is effective for emergency aid and belongs to beta-2 adrenergic agonists?

A. Salbutamol
B. Adrenaline
C. Ipratropium bromide
D. Platyphylline
E. Atropine

16. After an emotional upset a woman has been suffering from disturbed sleep for several days. What soporific drug would be preferable for this type of insomnia?

A. Nitrazepam
B. Phenobarbital
C. Ethaminal sodium (Pentobarbital)
D. Barbamylum (Amobarbital)
E. Chloral hydrate

17. To stop the bleeding the patient was prescribed a direct coagulant. During introduction of the solution the patient was complaining of pain along the vein, hot sensation, and palpitations. Name the drug that causes such symptoms:

A. Calcium chloride
B. Hirudine
C. Ergocalciferol
D. Pentoxyl
E. Streptokinase

18. A 4-year-old child has been admitted to an orthopaedic department with displaced shin fracture. Bone fragments reposition requires analgesia. What drug should be chosen?

A. Promedol
B. Analgin
C. Morphine hydrochloride
D. Panadol
E. —

19. A comatose patient was taken to the hospital. He has a history of diabetes mellitus. *Objectively*: Kussmaul breathing, low blood pressure, acetone odor of breath. After the emergency treatment the patient's condition improved. What drug had been administered?

A. Insulin
B. Adrenaline
C. Isadrinum
D. Glibenclamide
E. Furosemide

20. A 40-year-old patient suffers from bronchial asthma and prolonged tachycardia. Choose the optimal drug for rapid relief of bronchial spasm in the given case:

A. Salbutamol
B. Adrenalin hydrochloride
C. Ephedrine hydrochloride
D. Orciprenaline
E. Isoprenaline (Isadrinum)

21. A patient with urolithiasis has developed severe pain attacks. For pain shock prevention he was administered an antispasmodic narcotic analgesic along with atropine. Name this drug:

A. Promedol
B. Nalorphine
C. Tramadol
D. Ethylmorphine hydrochloride
E. Morphine hydrochloride

22. A patient with acute myocardial infarction has been administered heparin as a part of complex therapy. Some time after heparin injection the patient developed hematuria. What heparin antagonist should be injected to remove the complication?

A. Protamine sulfate
B. Vicasol
C. Aminocaproic acid
D. Neodicumarin
E. Fibrinogen

23. A 16-year-old young man suffering from seasonal allergic rhinitis has been prescribed a highly active second-generation H1 blocker, which can be characterized by absence of marked sedative action. Name this drug:

A. Loratadine
B. Pipolphen
C. Chloropyramine (Suprastin)
D. Indometacin
E. Erythromycin

24. UN volunteers have arrived to Nigeria to assist the locals in aftermath of earthquakes. What drug should they prescribe for individual chemoprophylaxis of malaria?

A. Chingamin
B. Pyrantel
C. Pyrimethamine (Chloridinum)
D. Primaquine
E. Interferon (Laferon)

25. A patient presents with dry peeling skin, frequent cases of acute respiratory diseases, xerophthalmia. What vitamin preparation should be prescribed in this case?

A. Retinol acetate
B. Thiamine
C. Cyanocobalamin
D. Menadione (Vikasolum)
E. Ergocalciferol

26. Prescription of penicillin G sodium salt has caused development of neurotoxic effects (hallucinations, convulsions). Such reaction is the result of antagonism with the following neurotransmitter:

A. GABA
B. Dopamine
C. Serotonin
D. Adenosine
E. Acetylcholine

27. Name the halogen-containing antiseptic with fungicidal properties, which is used to treat dermatomycosis:

A. Iodine solution

B. Formalin solution
C. Methylene blue
D. Brilliant green
E. Boric acid solution

28. A patient with arthritis has been prescribed an anti-inflammatory selective COX-2 inhibitor. Select this drug among those given below:
A. Celecoxib
B. Phenylbutazone (Butadion)
C. Dimethylsulfoxide (Dimexid)
D. Indometacin
E. Metamizole (Analgin)

29. A patient after disrupted cerebral circulation has developed paralysis. Choose the anticholinesterase drug to be prescribed in this case:
A. Proserin
B. Cordiamin
C. Aceclidine
D. Methacin
E. Hexamethonium (Benzohexonium)

30. A 5-year-old child has been diagnosed with acute right distal pneumonia. Sputum inoculation revealed that the causative agent is resistant to penicillin and sensitive to macrolides. What drug should be prescribed?
A. Azithromycin
B. Tetracycline
C. Gentamycin
D. Streptomycin
E. Ampicillin

31. Despite the administration of cardiotonics and thiazide diuretics a patient with chronic heart failure has persistent edemas and the risk of ascites arose. What medication should be administered to enhance the diuretic effect of the administered drugs?
A. Spironolactone
B. Furosemide
C. Amiloride
D. Clopamide
E. Manithol

32. When treating a patient with chronic cardiac failure a doctor detected bradycardia and deterioration of the patient's general state. Such a condition is caused by the cumulative effect of a drug. Which drug of those listed below has cumulative action?

A. Digoxin
B. Diphenhydramine (Dimedrol)
C. Hydrochlorothiazide
D. Isosorbide
E. Retinol acetate

33. A patient is diagnosed with acute morphine hydrochloride intoxication. Prescribe the oxidizing agent for gastric lavage:

A. Potassium permanganate
B. Chloramine
C. Sulfocamphocainum (Procaine + Sulfocamphoric acid)
D. Cerigel
E. Chlorhexidine (bi)gluconate

34. A patient has been given atropine sulfate for rapid relief of spastic colon symptoms. The use of this drug is contraindicated in the following disease:

A. Glaucoma
B. Bronchial asthma
C. Bradycardia
D. Hypotension
E. Gastric ulcer

35. A 47-year-old man developed intestinal colic against the background of essential hypertension. In this situation it would be most efficient to arrest the colic by administering drugs of the following group:

A. Myotropic antispasmodics
B. Anticholinesterase agents
C. Sympathomimetics
D. M-cholinomimetics
E. Adrenomimetics

36. A patient has developed paroxysmal ventricular tachycardia against the background of cardiac infarction. What antiarrhythmic drug should be chosen to avoid lowering cardiac output?

A. Lidocaine hydrochloride

B. Procainamide
C. Verapamil
D. Propranolol
E. Potassium chloride

37. Prolonged treatment of hypothyroidism has caused general dystrophy, dental caries, tachycardia, tremor of extremities. What drug is the cause of these side effects?
A. L-thyroxin
B. Humulin (Human insulin)
C. Parathyreoidinum
D. Thyrocalcitonin
E. Prednisolone

38. To treat rheumatoid arthritis a 65-year-old woman was prescribed an immunosuppressive hormonal drug as a part of her complex therapy. Name this drug:
A. Prednisolone
B. Thymus cytomedins (Thymalin)
C. Chloropyramine (Suprastin)
D. Riboflavin
E. Fercovenum

39. An 18-year-old patient has developed candidiasis after the case of pneumonia treated with β-lactam antibiotic. What antimycotic agent should be prescribed?
A. Fluconazole
B. Streptomycin
C. Ampicillin
D. Phthalylsulfathiazole
E. Trimethoprim/sulfamethoxazole (Bi-septol)

40. A woman poisoned with an unknown substance was hospitalized in a toxicological department. What group of drugs can be administered to decrease absorption and introduction of the poison to her body?
A. Adsorbents
B. Neuroleptics
C. Antioxidants

D. Organic nitrates
E. Cholinesterase inhibitors

**Exercise 3. Translate the word combinations into Ukrainian.**

Suppress the central nervous system; several miscarriages in anamnesis; facilitate carrying of a pregnancy; intestinal peristalsis failed to restore; admission room; complaints of edemas, rapid heart rate and dyspnea; diagnosed with chronic heart failure; impaired vision of close objects; dilated pupils; indistinct speech; indicate overdosage of a drug; develop water retention; concomitant disease exacerbated; cancel prescription of a drug; necessitate cancellation; prescribe a drug with mucolytic action; specify the sleep-inducing mechanism of a drug; an appropriate drug; remove the complication; absence of marked sedative action; persistent edemas.

**Exercise 4. Give synonyms of the following words.**

| | | | |
|---|---|---|---|
| prescribe | | fast | |
| lower | | worsening | |
| treatment | | detect | |
| adverse effects | | medication | |
| stop | | excitation | |

**Exercise 5. Fill the table with the missing parts of speech.**

| Verb | Noun | Adjective | Adverb |
|---|---|---|---|
| prescribe | | | |
| | | active | |
| necessitate | | | |
| | agitation | | |
| | | prolonged | |
| | prevention | | |
| improve | | | |
| | admission | | |
| | risk | | |
| | coagulant | | |

**Exercise 6. Match the terms with their definitions:**

| | |
|---|---|
| 1) neurotransmitter | a) the innermost part of the adrenal gland, consisting of cells that secrete epinephrine (adrenaline), norepinephrine (noradrenaline), and a small amount of dopamine in response to stimulation by sympathetic preganglionic neurons |
| 2) synaptic cleft | b) an extreme, often life-threatening allergic reaction to an antigen to which the body has become hypersensitive. |
| 3) adrenal medulla | c) breakdown of the molecule glycogen into glucose, a simple sugar that the body uses to produce energy |
| 4) catecholamine | d) breakdown of fats and other lipids by hydrolysis to release fatty acids |
| 5) glycogenolysis | e) a group of eye diseases which result in damage to the optic nerve and cause vision loss |
| 6) lipolysis | f) the space that separates a neuron and its target cell at a chemical synapse |
| 7) glaucoma | g) a monoamine neurotransmitter, an organic compound that has a catechol (benzene with two hydroxyl side groups next to each other) and a side-chain amine |
| 8) anaphylactic shock | h) a chemical substance which is released at the end of a nerve fiber by the arrival of a nerve impulse and, by diffusing across the synapse or junction, effects the transfer of the impulse to another nerve fiber, a muscle fiber, or some other structure |

**Exercise 7. Fill the gaps in the text with the missing parts:**

**Poisoning by Belladonna Alkaloids**

Deliberate or accidental ingestion of belladonna alkaloids or other classes of drugs 1 _____ is a major cause of poisonings. Infants and young children are especially susceptible to the toxic effects of atropinic drugs. Indeed, many cases of intoxication in children have resulted from 2 _____ . Serious intoxication may occur in children who 3 _____ containing belladonna alkaloids. The diagnosis of atropine poisoning is suggested by 4 _____ — dry mouth, mydriasis, blurred vision, hot dry skin, and, in addition, hyperreexia, excitement, hallucinations, delirium

and later, cerebral depression and coma. As it was described with characteristic American verbal felicity — "hot as a hare, blind as a bat, dry as a bone, red as a beet and mad as a hen". The treatment of atropine (and other anticholinergic drugs) poisoning is on general lines. Measures to limit intestinal absorption should be initiated without delay 5 _____. For symptomatic treatment, anticholinesterase drug (physostigmine) is the rational therapy. This agent enters the central nervous system and 6 _____. Physostigmine 1–4 mg i. v. or i. m. is effective, though it may need repeating, 7 _____. If marked excitement is present, diazepam is the most suitable agent 8 _____. Ice bags and alcohol sponges help to reduce fever, especially in children.

a) ingest berries or seeds
b) a wide-spread paralysis of parasympathetic innervation
c) if the poison has been taken orally
d) with atropinic properties
e) reverses both the central and peripheral effects
f) for sedation and for control of convulsion
g) as its action (1–2 hours) is shorter than that of atropine
h) conjunctival instillation of atropine eye-drops

**Exercise 8. Match the name of a drug (A) to its pharmacological group (B) and indications for use (C).**

***A.*** Loratadine, Proserin, Digoxin, Atropine, Prednisolone, Celecoxib, Salbutamol, Promedol, Spironolactone, Corglyconum, Metronidazole, Lisinopril;

***B.*** Cardiac glycosides, Angiotensin-converting enzyme (ACE) inhibitors, Opioid analgesics, NSAID, Anticholinergic, Antihistamines, Corticosteroids, Antibiotics, Potassium-sparing diuretics, Acetylcholinesterase inhibitors, Beta2-adrenergic agonist;

***C.***

1) Hypertension, heart failure diabetic kidney disease
2) Chronic heart failure, atrial fibrillation
3) Bacterial and parasitic infections
4) Acute heart failure, atrial fibrillation
5) Edema, heart failure, hypertension, hyperaldosteronism
6) Acute left ventricular failure, pulmonary edema, cardiogenic shock; preoperative, operative and postoperative periods; labor (anesthesia and stimulation)
7) Asthma, chronic obstructive pulmonary disease (COPD)

8) Allergic rhinitis, hay fever, hives
9) Bradycardia, preanesthetic medication, organophosphate poisoning
10) Pain relief, arthritis
11) Myasthenia gravis, glaucoma
12) Inflammatory conditions, autoimmune disorders, asthma exacerbations

**Exercise 9. Match the terms to their definitions.**

| | |
|---|---|
| 1. Analgesia | a) the build-up of fluid in the space between the lining of the abdomen and abdominal organs |
| 2. Anamnesis | b) infectious disease produced by the yeastlike fungus Candida albicans and closely related species |
| 3. Antimycotic | c) fungal infections of the skin and skin appendages |
| 4. Ascites | d) convulsive |
| 5. Arthritis | e) inhibiting the growth of fungi |
| 6. Candidiasis | f) a trembling or shaking usually from physical weakness, emotional stress, or disease |
| 7. Dermatomycosis | g) insensibility to feel pain without loss of consciousness |
| 8. Palpitations | h) causing sleep or making a person want to sleep |
| 9. Paroxysmal | i) the taking of a patient's personal medical history |
| 10. Soporific | j) a disease that causes dry eyes due to vitamin A deficiency |
| 11. Tremor | k) the swelling and tenderness of one or more joints |
| 12. Xerophthalmia | l) feelings of having a fast-beating, fluttering or pounding heart |

**Exercise 10. Fill the gaps in the text with the missing parts.**

**Antifungal drugs**

Molds, yeasts, and 1. _____are all types of fungi. Of the millions of different species of fungi, only a few hundred are responsible for making people sick. Fungi can cause a variety of conditions. Most of them affect the nails or skin, causing 2. _____ conditions, but some can cause more serious infections. Fungi can cause 3. _____, blood in-

fections, and lung infections. Antifungal drugs are the medications people use to treat fungal infections. People can take antifungal drugs orally, apply them topically, or administer them intravenously 4. _____. Antifungal medications usually work either by killing the fungal cells or stopping them from 5. _____. There are four main types of antifungal drugs. These are:

— polyenes work by 6. _____ of the fungal cells to be more porous, thus making them more likely to burst

— azoles are known to be 7. _____ which inhibit the synthesis of sterol in fungi

— allylamines work by inhibiting an enzyme that the membrane of the cell requires to operate correctly

— echinocandins interfere with an enzyme involved in creating the fungal 8. _____.

| | | | |
|---|---|---|---|
| growing and multiplying | rashes or other skin | fungistatic agents | cell wall |
| altering the wall | meningitis | mushrooms | through an IV drip |

**Exercise 11. Translate the sentences into English.**

1. Пацієнт, який скаржиться на запаморочення, спрагу, утруднене ковтання та порушення зору близьких предметів, звернувся до лікаря.

2. Готуючись до відрядження за кордон, лікар отримав призначення протималярійного препарату як особистого засобу профілактики захворювання.

3. Після того, як пацієнтка приймала ліки деякий час, її супутня хвороба загострилася.

4. Це змусило лікаря скасувати призначення препарату.

5. Супутня хвороба потребувала скасування призначення ліків.

6. Під час введення розчину пацієнт скаржився на біль за ходом вени, відчуття жару та серцебиття.

7. Алкоголік страждає від алкогольного психозу з явним психомоторним збудженням.

8. Цей медикамент посилює сечогінну дію введених препаратів.

9. Застосування цього препарату протипоказано при такому захворюванні.

10. Цей антигістамінний препарат не пригнічує центральну нервову систему.

**Exercise 12. Match the parts of the sentences.**

| | | | |
|---|---|---|---|
| 1. | Your test results | a | test came back positive/negative |
| 2. | I'm afraid | b | the prognosis isn't good |
| 3. | You have a long | c | you're ready to go home |
| 4. | We have several | d | options to discuss |
| 5. | The blood | e | here overnight |
| 6. | The transfusion | f | diabetes |
| 7. | It looks like | g | road to recovery |
| 8. | I'd like to keep you | h | have come in |
| 9. | You're not | i | in the clear yet |
| 10. | We've ruled out | j | was a success |

# Chapter II

**Exercise 1. Key words:**

| Nouns | Verbs | Adjectives | Adverbs |
|---|---|---|---|
| constipation | affect | biliary | arbitrarily |
| department | complain | efficient | however |
| derivative | deliver | incompatible | mistakenly |
| edema | eliminate | intermittent | |
| edemata | enable | intravenous | |
| heartburn | face | numerous | |
| inoculation | relate | primary | |
| itching | remedy | recurrent | |
| level | reveal | subcutaneous | |
| manifestation | undergo | unbearable | |
| origin | | | |
| response | | | |
| solution | | | |
| response | | | |

**Exercise 2. Read the tests.**

1. A patient with chronic heart failure with edema has increased level of blood aldosterone. What diuretic would be most effective in this case?

A. Spironolactone
B. Triamterene
C. Acetazolamide
D. Hydrochlorothiazide
E. Furosemide

2. A patient complaining of rapid pulse, dyspnea and bluish color of mucosa has been admitted to the cardiological department. The objective symptoms are as follows: edema of lower extremities, ascites. Which of the given medicines should be prescribed for intravenous administration to improve the patient's general state?

A. Corglyconum
B. Cordiamin
C. Adrenalin hydrochloride
D. Digitoxin
E. Drotaverine

3. A patient who had been taking diclofenac sodium for arthritis of the mandibular joint developed an acute condition of gastric ulcer. Such side effect of this medicine is caused by inhibition of the following enzyme:
A. Cyclooxygenase-1 (COX-1)
B. Cyclooxygenase-2 (COX-2)
C. Lipoxygenase
D. Phosphodiesterase
E. Monoamine oxidase

4. A 55-year-old male had been delivered to the resuscitation unit unconscious. Relatives reported him to have mistakenly drunk an alcoholic solution of unknown origin. On examination the patient was diagnosed with methanol intoxication. What antidote should be used in this case?
A. Ethanol
B. Teturamum
C. Naloxone
D. Protamine sulfate
E. Acetylcysteine

5. A 68-year-old patient consults a cardiologist, complaining of high arterial blood pressure, pain in the heart region, intermittent pulse. Prescribe the $\beta_1$-adrenoreceptor blocker for the treatment of the described pathology:
A. Metoprolol
B. Morphine hydrochloride
C. Nootropil
D. Fenoterol
E. Benzylpenicillin

6. A 35-year-old female patient has been hospitalised with acute intoxication caused by salts of high-density metals (lead, most probably). As a part of complex therapy, the antidote that contains two active sulfhydric groups has been prescribed. Specify this antidote:

A. Dimercaprol
B. Metamizole
C. Mannitol
D. Nalorphine hydrochloride
E. Calcium chloride

7. A 63-year-old male patient with bladder atony had been prescribed medication, which he had been arbitrarily taking at a higher dose. The patient developed hyperhydration, salivation, diarrhea, muscle spasms. The prescribed drug relates to the following group:
A. Cholinomimetics
B. Cholinesterase reactivators
C. Adrenergic blockers
D. Tocolytics
E. Ganglionic blockers

8. A patient complains of photoreception disorder and frequent acute viral diseases. He has been prescribed a vitamin that affects photoreception processes by producing rhodopsin, the photosensitive pigment. What vitamin is it?
A. Retinol acetate
B. Tocopherol acetate
C. Pyridoxine hydrochloride
D. Cyanocobalamin
E. Thiamine

9. A girl receives antibiotics of the penicillin group for acute bronchitis. On the third day of treatment she developed allergic dermatitis. Which drug should be administered?
A. Loratadine
B. Cromolyn sodium
C. Beclomethasone
D. Ephedrine hydrochloride
E. Levamisole

10. It is known that individuals with genetically caused deficiency of glucose-6-phosphate dehydrogenase may develop RBC hemolysis in response to the administration of some antimalarial drugs. Manifestation of adverse reactions to drugs is called:

A. Idiosyncrasy
B. Allergy
C. Sensibilization
D. Tachyphylaxis
E. Tolerance

11. A patient with urolithiasis has unbearable spasmodic pain. To prevent pain shock, he has been given an injection of atropine along with a narcotic analgesic having antispasmodic effect. What drug was it?
A. Promedol
B. Nalorphine
C. Tramadol
D. Ethylmorphine hydrochloride
E. Morphine hydrochloride

12. Despite the administration of cardiotonics and a thiazide diuretic a patient with chronic heart failure has persistent edemata, there is a risk of ascites. What medication should be administered in order to enhance the diuretic effect of the drugs used?
A. Spironolactone
B. Furosemide
C. Amiloride
D. Clopamide
E. Manithol

13. A 66-year-old patient with Parkinson's disease shows an improvement in locomotor activity after prolonged use of a certain drug which is converted to dopamine by the decarboxylation. What drug has the patient taken?
A. Levodopa
B. Naloxone
C. Celecoxib
D. Droperidol
E. Chlorpromazine

14. A patient has recurrent attacks of epileptic seizures and stays unconscious between them. In order to stop convulsions, the drugs of the following group should be used in the first place:

A. Tranquilizers
B. Neuroleptics
C. Muscle relaxants
D. Sedatives
E. Analeptics

15. A patient with arthritis and varicose veins has been taking a non-steroidal antiinflammatory drug for a long time, which caused thrombosis of skin veins. Which of the following drugs might have caused this complication?
A. Celecoxib
B. Indomethacin
C. Aspirin
D. Phenylbutazone
E. Ibuprofen

16. Examination of a child who hasn't got fresh fruit and vegetables during winter revealed numerous subcutaneous hemorrhages, gingivitis, carious cavities in teeth. What vitamin combination should be prescribed in this case?
A. Ascorbic acid and rutin
B. Thiamine and pyridoxine
C. Folic acid and cobalamin
D. Riboflavin and nicotinamide
E. Calciferol and ascorbic acid

17. A patient suffering from chronic hyperacidic gastritis takes an antacid drug for heartburn elimination. After its ingestion the patient feels better but at the same time he has a sensation of stomach swelling. Which of the following drugs might be the cause of such side effect?
A. Sodium hydrocarbonate
B. Magnesium oxide
C. Magnesium trisilicate
D. Aluminium hydroxide
E. Pepsin

18. A 63-year-old patient with collapse presentations was delivered to the emergency hospital. A physician has chosen noradrenalin against hypotension. What is its mechanism of action?

A. Activation of $\alpha_1$-adrenoreceptors
B. Activation of serotonin receptors
C. Activation of $\beta$-adrenoreceptors
D. Activation of dopamine receptors
E. Block of *M* — cholinoreceptors

19. A patient suffering from syphilis has been treated with bismuth preparations. As a result of it some grey spots turned up on the mucous membrane of the oral cavity; nephropathy symptoms were also present. What drug should be used for treatment of bismuth intoxication?
A. Unithiol
B. Methylene blue
C. Naloxone
D. Bemegride
E. Nalorphine

20. A 65-year-old patient with chronic heart failure has been taking digitoxin in self administered doses for a long time. She was admitted to the hospital for general health aggravation, arrhythmia, nausea, reduced diuresis, insomnia. What is the primary action to be taken?
A. To withhold digitoxin
B. To reduce digitoxin dosage
C. To administer strophanthine intravenously
D. To administer digoxin
E. To give an intravenous injection of calcium gluconate solution

21. A 20-year-old patient complains of morbid thirst and hyperdiuresis (up to 10 l daily). Glucose concentration in blood is normal but it is absent in urine. The patient has been diagnosed with diabetes insipidus. What hormonal drug is the most appropriate for management of this disorder?
A. Vasopressin
B. Cortisol
C. Thyroxin
D. Oxytocin
E. Insulin

22. A nurse accidentally injected a nearly double dose of insulin to a patient with diabetes mellitus. The patient lapsed into a hypoglycemic coma. What drug should be injected in order to help him out of coma?

A. Glucose
B. Lidase
C. Insulin
D. Somatotropin
E. Noradrenaline

23. While under barbituric anaesthesia a year-old male patient developed respiratory inhibition. Anesthesiologist made him a 10 ml intravenous injection of 0.5% bemegride solution. The patient's condition got better, the pulmonary ventilation volume increased. What phenomenon underlies the interaction of these medications?
A. Direct antagonism
B. Indirect antagonism
C. Unilateral antagonism
D. Direct synergism
E. Indirect synergism

24. After 4 months of treatment for tuberculosis the patient began complaining of toes and fingers numbness, sensation of creeps. He was diagnosed with polyneuritis. What antituberculous drug might have caused these complications?
A. Isoniazid
B. Rifampicin
C. Ciprofloxacin
D. Sodium salt of benzylpenicillin
E. Alcohol iodine solution

25. A patient with epilepsy and depressive reaction has been administered a drug that reduced epilepsy manifestations and improved the patient's psychic condition.
A. Sodium valproate
B. Ethosuxemide
C. Amitriptyline
D. Phenytoin
E. Phenobarbital

26. A patient diagnosed with morphinism has been admitted to the narcological department. A doctor noted a decrease in pharmacological ac-

tivity of morphine. Repetitive use of a drug may result in tolerance to its effect, and this phenomenon is called:

A. Addiction
B. Cumulation
C. Tachyphylaxis
D. Antagonism
E. Allergy

27. A man got poisoned with mushrooms. They contain muscarine that stimulates muscarinic cholinoreceptors. What symptom is typical for poisoning with inedible mushrooms?

A. Miosis
B. Mydriasis
C. Bronchi dilation
D. Heart rate rise
E. Arterial pressure rise

28. In spite of treatment with cardiotonics and thiazide diuretic a patient suffering from chronic cardiac failure still presents with edemata and faces a risk of ascites. What medication should be administered in order to increase the diuretic effect of the above mentioned drugs?

A. Spironolactone
B. Furosemide
C. Amiloride
D. Clopamide
E. Manithol

29. A 66-year-old female patient got intravenous injection of magnesium sulfate solution for the purpose of elimination of hypertensive crisis. But arterial pressure didn't go down and after repeated introduction of the same preparation there appeared sluggishness, slow response, inhibition of consciousness and respiration. What preparation is the antagonist of magnesium sulfate and can eliminate symptoms of its overdose?

A. Calcium chloride
B. Potassium chloride
C. Sodium chloride
D. Activated carbon
E. Potassium permanganate

30. A patient underwent appendectomy. In the postoperative period he has been taking an antibiotic. The patient complains about hearing impairment and vestibular disorders. What group of antibiotics has such by-effects?

A. Aminoglycosides
B. Penicillins
C. Tetracyclines
D. Macrolides
E. Cephalosporins

31. A patient consulted a dentist about itching and burning in the oral cavity; high temperature. The patient was diagnosed with trichomonal gingivostomatitis. What drug should be chosen for his treatment?

A. Metronidazole
B. Ampicillin
C. Doxycycline hydrochloride
D. Gentamicin sulfate
E. Nystatin

32. A patient has been diagnosed with transmural myocardial infarction. What drug should be given in order to prevent cardiogenic shock?

A. Promedol
B. Reserpin
C. Octadine
D. Phentolamine
E. Analgin

33. A patient suffers from pulmonary tuberculosis. During treatment neuritis of visual nerve arose. What drug has caused this by-effect?

A. Isoniazid
B. Ethambutol
C. Kanamycin
D. Rifampicin
E. Streptomycin

34. For relief of hypertensive crisis a doctor administered a patient a drug that apart from antihypertensive effect has also sedative, spasmolytic and anticonvulsive effect. The drug was taken parenterally. When it is tak-

en enterally it acts as a laxative and cholagogue. What drug was administered?

A. Magnesium sulfate
B. Dibasolum
C. Reserpine
D. No-spa
E. Apressin

35. A patient with diabetes mellitus complicated by angiopathy has been recommended a drug which is a sulphonyl urease derivative of the second generation. It improves microcirculation and is known for its relatively good tolerance. What drug is it?

A. Glibenclamide
B. Glibutidum
C. Insulin
D. Acarbose
E. Adrenalin

36. A 30-year-old patient complains about having abdominal pain and diarrhea for five days; body temperature has raised up to 37.5°C along with chills. The day before a patient was in a forest and drunk from an open water reservoir. Laboratory analyses enabled the following diagnosis: amebic dysentery. What is the drug of choice for its treatment?

A. Metronidazole
B. Furazolidone
C. Levomycetin
D. Phthalazol
E. Emetine hydrochloride

37. A patient suffering from stomach ulcer has been treated with an antacid drug almagel. For acute bronchitis treatment he was prescribed the antibiotic methacycline. However, within the next 5 days the fever didn't fall, the cough and sputum nature remained unchanged. The physician came to the conclusion that the drugs were incompatible. What type of drug incompatibility is the case?

A. Pharmacokinetic, absorption stage
B. Pharmacokinetic, biotransformation stage
C. Pharmaceutic

D. Pharmacodynamic
E. Direct antagonism

38. A patient suffering from myasthenia has been administered proserin. After its administration the patient has got nausea, diarrhea, twitch of tongue and skeletal muscles. What drug would help to eliminate the intoxication?
A. Atropine sulfate
B. Physostigmine
C. Pyridostigmine bromide
D. Isadrine
E. Mesatonum

39. A patient with essential hypertension has a high rate of blood renin. Which of antihypertensive drugs should be preferred?
A. Lisinopril
B. Propranolol
C. Prazosinum
D. Nifedipine
E. Dichlothiazide

40. This drug has a destructive effect on erythrocytic forms of malarial plasmodia and dysenteric amoebae. It is used for treatment and prevention of such diseases as malaria, amebiasis and interstitial disease. What drug is it?
A. Chingamin
B. Emetine hydrochloride
C. Tetracycline
D. Erythromycin
E. Quinine

**Exercise 3. Translate the word combinations into Ukrainian.**

Detect ascarid eggs; be born asphyxiated; bluish color of mucosa; prescribed for intravenous administration; arthritis of mandibular joint; be delivered to the resuscitation unit unconscious; alcoholic solution of unknown origin; broad spectrum antibiotic; causal treatment drug; intermittent pulse; salts of high-density metals; male patient with bladder atony; complain of photoreception disorder; prolonged nosebleeds; efficient in remedying a condition; a patient with biliary dyskinesia and constipations;

laxative effect; manifestation of adverse reactions; unbearable spasmodic pain; persistent edemata; enhance the diuretic effect; recurrent attacks of epileptic seizures; reveal numerous subcutaneous hemorrhages; causative agent resistant to penicillin; take an antacid drug for heartburn elimination; a sensation of stomach swelling; complain of morbid thirst and hyperdiuresis.

**Exercise 4. Find synonyms of the following words in the tests.**

| | | | |
|---|---|---|---|
| urinative | | bring | |
| primary hypertension | | wide | |
| efficient | | epistaxis | |
| suitable | | treat | |
| respiration | | obstipation | |

**Exercise 5. Fill the table with the missing parts of speech.**

| Verb | Noun | Adjective | Adverb |
|---|---|---|---|
| | | destructive | |
| list | | | |
| | conclusion | | |
| supply | | | |
| | | visual | |
| face | | | |
| | response | | |
| enable | | | |
| | choice | | |
| change | | | |

**Exercise 6. Match the terms with their definitions.**

| | |
|---|---|
| 1) broadspectrum antibiotic | a) occasional beats are skipped, caused by conditions such as premature atrial contractions, premature ventricular contractions, and atrial fibrillation. Synonym: irregular pulse |
| 2) intermittent pulse | b) an escape of blood from a ruptured blood vessel |
| 3) biliary dyskinesia | c) sometimes called a flaccid |
| 4) hemorrhages | d) acts on the two major bacterial groups, gram-positive and gram-negative, or any antibiotic that acts against a wide range of disease-causing bacteria |
| 5) elimination | e) is a substance which neutralizes stomach acidity and is used to relieve heartburn, indigestion or an upset stomach |
| 6) antacids | f) an abnormal or excessive thirst, or a craving for unusual forms of drink |
| 7) atonic bladder | g) is a disorder of some component of biliary part of the digestive system in which bile physically can not move normally in the proper direction through the tubular biliary tract |
| 8) morbid thirst | h) the complete removal or destruction of something |

**Exercise 7. Fill the gaps in the text with the missing parts.**

**Neurotransmitters**

Each neuron is a distinct anatomic unit. Communication between nerve cells — and between nerve cells and effector organs — 1_____, called neurotransmitters, from the nerve terminals. This release depends on processes that are triggered by $Ca^{++}$ uptake and regulated by phosphorylation of synaptic proteins. The neurotransmitters rapidly diffuse across 2_____ between nerve endings and 3_____. Types of neurotransmitters. Although over 50 chemical signal molecules in the nervous system have tentatively been identified, 6 signal compounds–norepinephrine (and closely related epinephrine), acetylcholine, dopamine, serotonin, histamine, and γ-amino butyric acid–are most 4_____. Each

of these chemical signals binds to a specific family of receptors. Cholinergic and adrenergic neurotransmitters are 5_____ in the autonomic nervous system, whereas a wide variety of neurotransmitters function in the CNS.

*Acetylcholine.* 6_____ can be classified into two groups based 7_____. If transmission is mediated by acetylcholine, the neuron is termed **cholinergic**. Acetylcholine mediates 8_____in both the sympathetic and parasympathetic nervous systems. It is the neurotransmitter at the adrenal medulla. Transmission from the autonomic postganglionic nerves to the effector organs in the parasympathetic system also involves the release of acetylcholine.

a) the primary chemical signals
b) the transmission of nerve impulses across autonomic ganglia
c) occurs through the release of specific chemical signals
d) commonly involved in the actions of therapeutically useful drugs
e) on the chemical nature of the neurotransmitter released
f) the synaptic cleft or gap (synapse)
g) combine with specific receptor on the postsynaptic (target) cell
h) the autonomic nerve fibers

**Exercise 8. Match the terms to their definitions.**

| Amebic dysentery, bladder atony, epileptic seizures, gastric ulcer, gingivostomatitis, heart failure, hyperdiuresis, myasthenia, urolithiasis, nephropathy, polyneuritis, tuberculosis |
|---|

1. An open sore or raw area in the lining of the stomach or intestine.
2. A lifelong condition in which the heart muscle can't pump enough blood to meet the body's needs for blood and oxygen.
3. A chronic autoimmune, neuromuscular disease that causes weakness in the skeletal muscles
4. The formation of calcifications in the urinary system, usually in the kidneys or ureters, but may also affect the bladder and/or urethra.
5. The clinical manifestation of an abnormal, excessive, purposeless and synchronized electrical discharge in the brain cells.
6. A severe form of amebiasis associated with stomach pain, bloody stools (poop), and fever.
7. The inability to effectively contract the bladder resulting in excessive urine storage

8. A painful oral infection that can cause blisters on the lips and canker sores in the mouth.

9. Is caused by a bacterium called Mycobacterium tuberculosis.

10. A broad medical term used to denote disease or damage of the kidney, which can eventually result in kidney failure.

11. Excessive secretion of urine

12. The simultaneous malfunction of many peripheral nerves throughout the body.

**Exercise 9. Fill the gaps in the text with the missing parts.**

| Cardiac muscle contraction, cardiac rhythm, electrical impulse, intracellular calcium, irregular impulses, side effects, the heartbeat, the shortening |
|---|

**Cardiac glycosides**

Cardiac glycosides have disadvantageous 1. _____. They include a tendency to block conduction of the 2. _____ that causes contraction as it passes from the atria to the ventricles of the heart (heart block). Cardiac glycosides also have a tendency to produce an abnormal 3. _____ by causing electrical impulses to be generated at points in the heart other than the normal pacemaker region, the cells that rhythmically maintain 4. _____. These 5. _____ result in ectopic heartbeats, which are out of sequence with the normal cardiac rhythm. Cardiac glycosides are believed to increase the force of 6. _____ by binding to and inhibiting the action of a membrane enzyme that extrudes sodium ions from the cell interior. These drugs also enhance the release of calcium from internal stores, resulting in a rise in 7. _____. This subsequently increases the force of contraction, since intracellular calcium ions are responsible for initiating 8. _____ of muscle cells.

**Exercise 10. Match the terms to their definitions.**

| Allergic dermatitis, antidote, appendectomy, arrhythmia, diarrhea, drug incompatibility, hypehydration, insomnia, nausea, photoreception, resuscitation unit, salivation |
|---|

1. Water intoxication or water poisoning.

2. A chemical, especially a drug, that limits the effects of a poison.

3. A feeling of sickness with an inclination to vomit.

4. The undesirable reaction between a drug and a solution, container or another drug.

5. The condition of having at least three loose, liquid, or watery bowel movements each day.

6. Any problem in the rate or rhythm of a person's heartbeat.

7. The act of producing saliva (= liquid) in the mouth.

8. The surgical removal of the appendix, which is located in the right lower side of the abdomen.

9. An intensive care room.

10. The condition of being unable to sleep, over a period of time.

11. Ability of color vision and night vision.

12. An itchy, swollen rash caused by skin's reaction to an allergen or irritant in the environment.

**Exercise 11. Translate the sentences into English.**

1. Наведені сечогінні засоби не мають сечогінної дії у пацієнта із хворобою Аддісона.

2. Хворому з кардіогенним шоком, гіпотонією, асфіксією та набряками зробили ін'єкцію неглікозидного кардіотоніка.

3. Пацієнт з первинною гіпертензією має високий рівень реніну крові.

4. Лікар дійшов висновку, що препарати несумісні.

5. Для купірування гіпертонічного кризу лікар призначив пацієнту препарат, який, крім антигіпертензивної дії має ще й седативну, спазмолітичну та протисудомну дію.

6. Антиангінальний препарат, який зменшує споживання міокардом кисню, також покращує кровопостачання міокарда.

7. Пацієнт порадився зі стоматологом щодо свербежу та печіння в ротовій порожнині.

8. 55-річного чоловіка доставили до реанімаційного відділення без свідомості.

9. Пацієнт 30 років із минулим анамнезом вірусного гепатиту скаржиться на тривалі кровотечі з носа.

10. Пацієнт впав у гіпоглікемічну кому.

# COURSE REVIEW

**Exercise 1. Read the tests.**

**1**. A 60-year-old patient with a long history of atherosclerosis and a previous myocardial infarction developed an attack of retrosternal pain. 3 days later the patient was hospitalized and then died of progressive cardiovascular insufficiency. During autopsy a white fibrous depressed area about 3 cm in diameter with clear margins was found within the area of the posterior wall of the left ventricle and interventricular septum. The dissector considered these changes to be:

A. Focal cardiosclerosis
B. Myocardial ischemia
C. Myocardial infarction
D. Myocarditis
E. Myocardial degeneration

2. A patient with hypertension has developed headache, tinnitus, vomiting, high BP up to 220/160 mm Hg. On examination: facial asymmetry on the right, volitional mobility is absent, increased tendon reflexes and muscle tone of extremities on the right. What motor disorder of the nervous system occurred in this case?

A. Hemiplegia
B. Paraplegia
C. Tetraplegia
D. Hyperkinesis
E. Monoplegia

3. A patient complaining of dizziness, thirst, difficult swallowing, and impaired vision of close objects has addressed a doctor. Objectively: respiratory rate is increased, pupils are dilated, general agitation, talkativeness, though the speech is indistinct. BP is 110/70 mm Hg, heart rate is 110/min. Given symptoms can indicate overdosage of the following drug:

A. Atropine
B. Morphine
C. Ephedrine
D. Aminazine
E. Caffeine

4. Histologic specimen of a kidney demonstrates cells closely adjoined to the renal corpuscle in the distal convoluted tubule. Their basement membrane is extremely thin and has no folds. These cells sense the changes in sodium content of urine and influence renin secretion occurring in juxtaglomerular cells. Name these cells:

A. Macula densa cells
B. Juxtaglomerular cells
C. Mesangial cells
D. Podocytes
E. Glomerular capillary endothelial cells

5. A patient has hoarseness of voice. During laryngoscopy a gray-white larynx tumor with papillary surface has been detected. Microscopic investigation has shown the following: growth of connective tissue covered with multilayer, strongly keratinized pavement epithelium, no cellular atypia. What is the most likely diagnosis?

A. Papilloma
B. Fibroma
C. Polyp
D. Angioma
E. Angiofibroma

6. A 35-year-old man has been delivered into a surgical ward with a suppurating wound in the neck, anterior to trachea (previsceral space). If a surgical operation is not performed urgently, there is a risk of infection spreading to:

A. Thoracic cavity — anterior mediastinum
B. Thoracic cavity — middle mediastinum
C. Thoracic cavity — posterior mediastinum
D. Retrovisceral space
E. Interaponeurotic suprasternal space

7. Characteristic sign of glycogenosis is muscle pain during physical work. Blood examination usually reveals hypoglycemia. This pathology is caused by congenital deficiency of the following enzyme:

A. Glycogen phosphorylase
B. Glucose 6-phosphate dehydrogenase
C. α-amylase

D. γ-amylase
E. Lysosomal glucosidase

8. During autopsy approximately 2.0 liters of pus have been found in the abdominal cavity of the body. Peritoneum is dull and of grayish shade, the serous tunic of intestines has grayish-colored coating that is easily removable. Specify the most likely type of peritonitis in the patient:
A. Fibrinopurulent peritonitis
B. Hemorrhagic peritonitis
C. Serous peritonitis
D. Tuberculous peritonitis
E. —

9. Autopsy of a body revealed bone marrow hyperplasia of tubular and flat bones (pyoid marrow), splenomegaly (6 kg) and hepatomegaly (5 kg), enlargement of all lymph node groups. What disease are the identified changes typical of?
A. Chronic myelogenous leukemia
B. Chronic lymphocytic leukemia
C. Multiple myeloma
D. Polycythemia vera
E. Hodgkin's disease

10. Parents of a sick 5-year-old girl visited a genetic consultation. Karyotype investigation revealed 46 chromosomes. One chromosome of the 15th pair was abnormally long, having a part of the chromosome belonging to the 21st pair attached to it. What mutation occurred in this girl?
A. Translocation
B. Deletion
C. Inversion
D. Deficiency
E. Duplication

11. A patient consulted a doctor with complaints of dyspnea occurring after physical exertion. Physical examination revealed anemia, paraprotein was detected among gamma globulins. What value should be determined in the patient's urine to confirm the diagnosis of myeloma?
A. Bence Jones protein
B. Bilirubin

C. Hemoglobin
D. Ceruloplasmin
E. Antitrypsin

12. A 26-year-old woman consulted a doctor about having stool with white flat moving organisms resembling noodles. Laboratory analysis revealed proglottids with the following characteristics: long, narrow, with a longitudinal channel of the uterus with 17–35 lateral branches on each side. What kind of intestinal parasite was found?
A. Taeniarhynchus saginatus
B. Taenia solium
C. Hymenolepis nana
D. Diphyllobothrium latum
E. Echinococcus granulosus

13. A man is 28 years old. Histological investigation of the cervical lymph node revealed a change of its pattern due to proliferation of epithelioid, lymphoid cells and macrophages with horseshoe-shaped nuclei. In the center of some cell clusters there were non-structured light-pink areas with fragments of nuclei. What disease are these changes typical of?
A. Tuberculosis
B. Hodgkin's disease
C. Actinomycosis
D. Tumor metastasis
E. Syphilis

14. Autopsy of a man with tuberculosis revealed a 3x2 cm large cavity in the superior lobe of the right lung. The cavity was interconnected with a bronchus, its wall was dense and consisted of three layers: the internal layer was pyogenic, the middle layer was made of tuberculous granulation tissue and the external one was made of connective tissue. What is the most likely diagnosis?
A. Fibrous cavernous tuberculosis
B. Fibrous focal tuberculosis
C. Tuberculoma
D. Acute focal tuberculosis
E. Acute cavernous tuberculosis

15. Poisoning caused by mercury (II) chloride (corrosive sublimate) occurred in the result of safety rules violation. In 2 days, the patient's diurnal diuresis was 620 ml. The patient developed headache, vomiting, convulsions, dyspnea; moist crackles were observed in the lungs. Name this pathology:

A. Acute renal failure
B. Chronic renal failure
C. Uremic coma
D. Glomerulonephritis
E. Pyelonephritis

16. A patient hospitalized due to mercury intoxication presents with the following processes in the kidneys: focal necrotic changes of tubules of major renal regions, edema, leukocyte infiltration and hemorrhages in the interstitial tissue, venous congestion. What condition developed in the patient?

A. Acute necrotic nephrosis
B. Acute glomerulonephritis
C. Chronic renal failure
D. Acute pyelonephritis
E. Chronic pyelonephritis

17. Autopsy of a 40-year-old woman, who died of cerebral hemorrhage during hypertensic crisis, revealed: upper body obesity, hypertrichosis, hirsutism, stretchmarks on the skin of thighs and abdomen. Pituitary basophil adenoma is detected in the anterior lobe. What diagnosis is the most likely?

A. Cushing's disease
B. Essential hypertension
C. Alimentary obesity
D. Simmonds' disease
E. Hypothalamic obesity

18. A worker of an agricultural enterprise had been suffering from an acute disease with aggravating intoxication signs, which resulted in his death. On autopsy: the spleen is enlarged, flaccid, dark cherry-red in the section, yields excessive pulp scrape. Soft meninges of the fornix and base of the brain are edematous and saturated with blood ("cardinal's cap").

Microscopically: serous hemorrhagic inflammation of meninges and cerebral tissues. Make the diagnosis:

A. Anthrax
B. Tularemia
C. Plague
D. Cholera
E. Brucellosis

19. Autopsy of an 8-month-old boy, who died of severe pneumonia complicated with sepsis, revealed absence of thymus. Lymph nodes have no lymphoid follicles and cortical substance. In the spleen the follicles are decreased in size and have no light centers. What is the cause of such changes?

A. Thymus agenesis
B. Thymus aplasia
C. Thymus atrophy
D. Thymus hypoplasia
E. Accidental thymic involution

20. A patient died of cancerous cachexia with primary localization of cancer in the stomach. Autopsy revealed acutely enlarged liver with uneven surface and numerous protruding nodes; the nodes had clear margins in the section, rounded shape, gray-pink color, varying density, sometimes contained necrotic foci. Histologically: there are atypical cells in the nodes. What pathologic process occurred in the liver?

A. Cancer metastases
B. Abscesses
C. Regeneratory nodes
D. Infarction
E. Hepatic cancer

21. At the post-mortem examination the stomach of a patient with renal failure was found to have a yellow-brown coating on the thickened mucosa. The coating was firmly adhering to its surface and had significant thickness. Microscopy revealed congestion and necrosis of mucosal and submucosal layers, fibrin presence. What is the most likely diagnosis?

A. Fibrinous gastritis
B. Croupous gastritis
C. Gastric abscess

D. Esogastritis
E. Corrosive gastritis

22. Examination of a 56-year-old woman with a history of type 1 diabetes mellitus revealed a disorder of protein metabolism that is manifested by aminoacidemia in the laboratory blood test values, and clinically by the delayed wound healing and decreased synthesis of antibodies. Which of the following mechanisms causes the development of aminoacidemia?
A. Increased proteolysis
B. Albuminosis
C. Decrease in the concentration of amino acids in blood
D. Increase in the oncotic pressure in the blood plasma
E. Increase in low-density lipoprotein level

23. A man has suffered multiple bone fractures of his lower extremities during a traffic accident. During transportation to a hospital his condition was further aggravated: blood pressure decreased, there were signs of pulmonary artery embolism. What kind of embolism is the most likely in the given case?
A. Fat embolism
B. Air embolism
C. Gas embolism
D. Tissue embolism
E. Thromboembolism

24. A patient with signs of osteoporosis and urolithiasis has been admitted to an endocrinology department. Blood test revealed hypercalcemia and hypophosphatemia. These changes are associated with abnormal synthesis of the following hormone:
A. Parathyroid hormone
B. Calcitonin
C. Cortisol
D. Aldosterone
E. Calcitriol

25. A laboratory has been investigating virulence of a diphtheria agent. In the process of the experiment the infection was introduced intraperitoneally into test animals. The dosage of bacteria resulting in 95%

mortality of test animals was found. What unit of virulence measurement was determined?

A. DLM
B. DCL
C. LD50
D. ID
E. LD5

26. A 40-year-old woman was diagnosed with glomerulonephritis based on her clinical symptoms and the results of urine analysis. Anamnesis states chronic tonsillitis. What microorganisms are the most likely cause for the kidney damage in this case?

A. Streptococci
B. Staphylococci
C. Escherichia
D. Mycoplasma
E. Meningococci

27. A man is suffering from diarrhea. In summer he spent his vacation in the south at the sea coast. Bacteria with the following properties were detected in his feces: gram-negative curved mobile monotrichous bacilli that do not produce spores or capsules. Bacilli are undemanding to nutrient medium but require alkaline reaction (pH 8.5–9.5). Described are the agents of the following enteric infection:

A. Cholera
B. Shigellosis
C. Typhoid fever
D. Colienteritis
E. Pseudotuberculosis

28. During pathomorphological renal investigation of a patient, who for a long time had been suffering from osteomyelitis and died of progressing renal failure, the following was revealed: deposits of homogeneous eosinophilic masses in glomerular mesangium, arterial and arteriolar walls, and stroma, which colored red when stained with Congo red. What pathological process is this?

A. Amyloidosis
B. Mucoid swelling
C. Calcinosis

D. Carbohydrate degeneration
E. Hyalinosis

29. 30 minutes after drinking mango juice a child suddenly developed a local swelling in the area of the soft palate, which impeded swallowing and, eventually, respiration. Mucosa of the swollen area was hyperemic and painless. The blood test revealed moderate eosinophilia. Body temperature was normal. Anamnesis states that the elder sister of the child has been suffering from bronchial asthma attacks. What kind of edema has developed in the child?

A. Allergic
B. Inflammatory
C. Cardiac
D. Alimentary
E. Hepatic

30. A patient with signs of intestinal infection (vomiting, diarrhea, abdominal pain) has been presenting with increasing symptoms of intoxication for three days. Papular rash appeared on the uncovered skin areas and spread to the torso. A doctor suspected pseudotuberculosis. What laboratory test allows confirming this diagnosis within the first week from the onset of disease?

A. Bacteriological
B. Microscopic
C. Serological
D. Allergic
E. Biological

**Exercise 2. A) Match the following terms with their description.**

| | |
|---|---|
| 1. Antitussive | a. promoting excretion of water |
| 2. Diuretic | b. acting on the mind |
| 3. Sedative | c. a mixture of liquids |
| 4. Antiemetic | d. a small glass vial |
| 5. Antineoplastic | e. by mouth |
| 6. Vasodilation | f. agent that destroys cancer cells |
| 7. Adrenergic | g. combined action of two or more drugs |

| | |
|---|---|
| 8. Psychotropic | h. as needed |
| 9. Hyperpyrexia | i. relieving nausea |
| 10. Countertransport | j. extremely high body temperature |
| 11. Synergy | k. every morning |
| 12. Emulsion | l. cough suppressant |
| 13. Ampule | m. without |
| 14. Expectorant | n. inducing relaxation |
| 15. Syringe | o. three times a day |
| 16. Tid | p. widening of a vessel |
| 17. Qam | q. sympathomimetic |
| 18. Prn | r. an instrument for injecting fluid |
| 19. S — | s. movement in an opposite direction |
| 20. Po | t. agent that induces coughing |

**B) Multiple choice: Select the best answer and write the letter of your choice to the left of each number.**

1. ___Another term for trade name is:
A. Indicated name
B. Generic name
C. Prescription name
D. Chemical name
E. Brand name

2. _____ An analgesic is used to treat:
A. Diarrhea
B. Arrhythmia
C. Psychosis
D. Pain
E. Thrombosis

3. _____ A drug that is administered topically is:
A. Swallowed
B. Injected
C. Applied to the skin

D. Placed under the tongue
E. Inserted with a catheter

4. _____ Drug administration by injection is described as:
A. Partial
B. Instilled
C. Encapsulated
D. A bolus
E. Parenteral

5. _____ Nitrates, beta blockers, and calcium channel blockers are used to treat disorders of the:
A. Liver
B. Brain
C. Spleen
D. Heart
E. Spinal cord

**C) Fill in the blanks:**

1. When a drug has lost its effect at a constant dose, the patient has developed _____.
2. Pharmacokinetics is study of the action and behavior of _____.
3. A hypnogenic agent is one that induces _____.
4. Phytomedicine is the practice of treating with _____.
5. A transdermal route of administration is through the _____.
6. Toxicology is the study of _____.

**D) Define each of the following words:**

1. Mucolytic _____
2. Psychotropic _____
3. Bronchodilation _____
4. Sublingual _____

**E) Define each of the following abbreviations:**

1. Rx _____
2. IM _____
3. USP _____

4. ad lib _____
5. mg _____
6. NSAIDs _____
7. FDA _____

**Exercise 3. A) Match to form appropriate word-combinations.**

| | |
|---|---|
| cerebral | impairment |
| motor | flow |
| blood cells | X-ray |
| excellent | urine |
| blood | vascular accident |
| coronary artery | scan |
| CT | syndrome |
| pulmonary | count |
| soaked in | disease |
| bowel | blood pressure |
| chest | emboli |
| unstable | health |

**B) Complete with word-combinations from A. Read the following case study and answer the questions following it.**

N. J., a 79-year-old man, was admitted to Al Qasimia Hospital on October 23, 2005. Prior to being admitted to the hospital, N. J. had been in _____. His troubles apparently began 3 weeks prior to being admitted. On October 23, N. J. ‘s son found him lying on the floor confused, and _____.

Mr J. was diagnosed as having an acute _____. This disorder can also be described as a “stroke”. It occurs when there is an interruption of normal _____ in one or more of the blood vessels that supply the brain. Thrombosis, embolism, and hemorrhage are the primary causes of a CVA. The tissues of the brain become ischemic, leading to hypoxia or anoxia with destruction or necrosis of the neurons, glia, and vasculature. Complications of CVA include _____, sensory and

_____, infection, pneumonia, contractures, and _____. CVA is the third leading cause of death in the USA and affects more than 500,000 Americans annually. He was widowed in November 2002. One of his daughters has _____; one son died of an MI at age 35; the other one died with lung cancer at 52. N. J. had been the primary caregiver of his daughter until she was admitted to the hospital 3 weeks ago. She is dying with a short _____ and cirrhosis and is now being taken care of in hospice.

Soon after being left alone, Mr N. J. ‘s appetite decreased and he had become congested. He was placed on Xanax to treat symptoms of depression. He had also been taking Augmentin for congestion. Also, his family noticed that he was suffering from confusion. As a result, they brought him into the Emergency Room for evaluation. The Emergency Room doctors performed a _____ of the brain which revealed evidence of old strokes. The doctors stopped the Augmentin and placed him on Zpack. This seemed to improve his state of confusion, as well as reduce his symptoms of congestion.

On October 22, 2005, he was seen for the congestion. The doctor examined him thoroughly. This exam included giving him a _____. The chest X-ray proved to be normal. His white _____ was elevated and he was found to be mildly dehydrated. He was prescribed Amoxicillin 500 three times a day, and Guaifenesin. His past medical history is short including depression, stroke, and presbyacusis. He has not had any prior surgery and there are no known allergies.

**C) Choose the best answer.**

1. Ischemic stroke is generally caused by
A. Hemorrhage
B. Hematoma
C. Thrombosis
D. Hemiparesis
2. Signs and symptoms that occur together are termed
A. Prodrome
B. Syndrome
C. Exacerbation
D. Remission

**D) Write a medical term from the case study for each of the following meanings:**

1. Obstruction or occlusion of a blood vessel _____
2. Coagulation of the blood within a blood vessel in any part of the circulatory system _____
3. Pertaining to the lungs _____
4. The condition of being unable to perform as a consequence of physical or mental unfitness _____
5. Deficiency in the amount of oxygen reaching body tissues _____
6. The delicate web of connective tissue that surrounds and supports nerve cells _____
7. An acute or chronic disease marked by inflammation of the lungs _____
8. A liver disease in which normal liver cells are gradually replaced by scar tissue, causing the organ to shrink, harden, and lose its function _____

**E) What does each of the following abbreviations stand for:**

A. CVA _____
B. CT _____
C. CAD_____

**F) Describe orally the case of N. J. briefly. Name three medicines he was given and explain their action:**

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Матеріали навчального посібника зорієнтовано на розвиток навичок роботи з медичними текстами англійською мовою. Зосереджено увагу на особливостях вживання медичної термінології у фахових матеріалах та специфіку їхнього перекладу, що сприяє підвищенню рівня підготовки до опрацювання іноземної медичної літератури. До кожної теми англійською мовою подано: актуальні ключові слова для вивчення, тести для розгляду, аналізу, перекладу та вправи для практичного застосування набутих знань. Зміст навчального посібника відповідає чинній робочій програмі з дисципліни.

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**КИР'ЯЗОВА Олена Вікторівна**
**АБРАМОВИЧ Вероніка Євгеніївна**
**ЛЕВИЦЬКА Анна Іванівна**
**ЦИБА Анастасія Андріївна**

**АНГЛІЙСЬКА МОВА**
**ЗА ПРОФЕСІЙНИМ СПРЯМУВАННЯМ**
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Одеський національний медичний університет
65082, Одеса, Валіховський пров., 2.
Свідоцтво суб'єкта видавничої справи ДК № 668 від 13.11.2001.
e-mail: office@onmedu.edu.ua тел: (048) 723-42-49 факс: (048) 723-22-15