

MINISTRY OF HEALTH CARE OF UKRAINE
KHARKIV NATIONAL MEDICAL UNIVERSITY

**METHODOLOGICAL NOTES FOR STUDENTS OF
5-6 COURSES OF MEDICAL FACULTIES**

**RECOMMENDATIONS FOR SOLVING TEST QUESTIONS OF THE
LICENSE EXAMINATION KROK-2
BY THE STUDENTS OF MEDICAL FACULTIES**

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These guidelines are for medical students 5-6 courses for preparing for the licensing exam KROK-2. The methodical instructions included testing tasks for phthisiology, which were selected from the booklet of KROK-2 for the 2015-2017 academic year. All the test assignments contain correct answers A with a brief justification and explanation, as well as thesaurus information about the incorrect answers. Each task has been prepared with a brief explanation according to the terms of the assignments and questions of the KROK-2 licensing exam.

INTRODUCTION

The world practice in the field of higher education proves that the implementation of teaching technologies of modernity is impossible without a testing procedure, since testing is the most effective form of creation of operative and reliable feedback in the organization and management of the educational process; gives an opportunity to objectively assess the level of knowledge, skills, skills and knowledge of students, minimize the factor of subjectivity, as well as organize independent work of students. Testing loads less psychologically both students and the teacher. Testing should be systemic and at university it should be conducted from the very beginning of the training of students to the end of their school. It is known that the main task of studying in a university is the formation and students of professional competencies. In order to find out whether the goal has been achieved, it is necessary to carry out precise and objective control, during which the level of knowledge (scientific-practical) knowledge of students is determined. The best form of control in this case should be test control. Test – is primarily an assessment tool, the use of which should accurately indicate the area and level of knowledge or unknown students. During a course at a medical university, a medical student is constantly faced with the need to solve test tasks, is one of the elements of preparation for the licensing exam of the KROK.

Successful passing of the exam is the result of painstaking work during the training at a medical university and is a prerequisite for obtaining a diploma in higher education in modern conditions. While preparing for the licensed exam KROK-2, the use of the instructions created aims to help the student correctly select the correct answer, substantiate the mistakenness of other answers, allows us to recall information in a short time on the various disciplines that were studied at different departments at 6-year training in medical the university, and improve the quality of the preparation for the KROK-2 licensed exam.

Explanations to the test questions for the preparation of 6-year students of the KhNMU for a standardized state licensed exam (KROK-2) on english language, which are recommended by the Center for Testing at the Ministry of Health of Ukraine (2015-2017 academic year).

1. A 48-year-old woman complains of pain in the thoracic spine, sensitivity disorder in the lower body, disrupted motor function of the lower limbs, body temperature rise up to 37,5°C. She has been suffering from this condition for 3 years. Treatment by various specialists was ineffective. X-ray reveals destruction of adjacent surfaces of the VIII and IX vertebral bodies. In the right paravertebral area at the level of lesion there is an additional soft tissue shadow. What diagnosis is most likely?

- A. Tuberculous spondylitis of the thoracic spine**
- B. Spinal tumor
- C. Multiple sclerosis
- D. Metastases into the spine
- E. Osteochondrosis

Correct answer - **Tuberculous spondylitis of the thoracic spine**

- A. **Tuberculous spondylitis** of the thoracic spine or Pott's disease is a form of tuberculosis that occurs outside the lungs whereby disease is seen in the vertebrae.
- B. **Spinal tumor** is a growth that develops within the spinal canal.
- C. **Multiple sclerosis** a demyelinating disease in which the insulating covers of nerve cells in the brain and spinal cord are damaged.
- D. **Metastases into the spine** is a vague term which can be variably taken to refer to metastatic disease to any of the following: vertebral metastases (94%), may have epidural extension intradural, extramedullary metastases (5%), intramedullary metastases (1%).
- E. **Osteochondrosis** is a family of ortopedic diseases of the joint that occur in children, adolescents and other rapidly growing animals, particularly pigs, horses, dogs, and broiler chickens.

It's tuberculosis spondylitis of the thoracic spine because: the patient is more chronically ill than acute; subdermal abscess which is typical for tuberculosis (additional shadow in the soft tissue) is present and treatment by various specialists was ineffective.

2. A patient suffering from infiltrative pulmonary tuberculosis was prescribed streptomycin, rifampicin, isoniazid, pyrazinamide, vitamin C. One month after the beginning of the treatment the patient started complaining of reduced hearing and tinnitus. What drug has such a side effect?

- A. **Streptomycin**
- B. Isoniazid
- C. Rifampicin
- D. Pyrazinamide
- E. Vitamin C

Correct answer – **Streptomycin**

A. Since **streptomycin** belongs to the group of aminoglycosides, which is characterized by a violation of the VIII pair of cranial nerves, i.e. ototoxicity, this particular drug caused the described adverse reactions.

B. The main side effects of **isoniazid** include peripheral polyneuropathy (due to competitive inhibition of vitamin B6) and hepatotoxicity. Ototoxicity and hearing impairment do not relate to the side effects of isoniazid.

C. **Rifampicin** is characterized by hepatotoxicity, nephrotoxicity, and also staining of biological fluids in red. Ototoxicity does not apply to the side effects of rifampicin

D. The main side effects of **pyrazinamide** are hepatotoxicity, allergic reactions, gastrointestinal disorders, hyperuricemia. Ototoxicity does not belong to the main side effects of pyrazinamide

E. **Vitamin C** has practically no side effects and contraindications except cases of individual intolerance. Ototoxicity also does not apply to the side effects of vitamin C.

Such adverse reaction of antituberculosis drugs as ototoxicity was provoked by streptomycin

3. A 32-year-old man complains of pain in the chest on the left, dyspnea, temperature rise up to 38, 0°C, slight cough. The disease onset was 2 weeks ago after overexposure to cold. He had suffered from bronchoadenitis in his childhood. The affected side lags during breathing; percussion reveals dull sound with oblique margin in the lower left lung, where breathing is absent. The right heart border is displaced outwards. Mantoux test with 2 TU resulted in a papule 16 mm in size. What diagnosis is most likely?

- A. **Tuberculous pleurisy**
- B. Central carcinoma of the left lung
- C. Congestion pneumonia
- D. Thromboembolism of the pulmonary artery branches

E. Community-acquired pneumonia

Correct answer - **Tuberculous pleurisy**

A. **Tuberculous pleurisy** results from inflammation of the membrane that covers the lungs (the pleura) caused by exposure to *Mycobacterium tuberculosis* bacteria infecting the lungs.

B. **Central carcinoma** is one of the non-small cell carcinomas of the lung, overtaken by adenocarcinoma of the lung as the most commonly encountered lung cancer.

C. **Congestion pneumonia** is a form of pneumonia that affects a large and continuous area of the lobe of a lung. It is one of the two anatomic classifications of pneumonia.

D. **Thromboembolism of the pulmonary artery branches** usually arise from thrombi that originate in the deep venous system of the lower extremities; however, they rarely also originate in the pelvic, renal, upper extremity veins, or the right heart chambers.

E. **Community-acquired pneumonia** refers to pneumonia (any of several lung diseases) contracted by a person with little contact with the healthcare system. The main difference between hospital-acquired pneumonia (HAP) and CAP is that patients with HAP live in long-term care facilities or have recently visited a hospital.

It's tuberculosis pleurisy because: tuberculosis of intrathoracic lymphatic nodes ("bronchoadenitis" was present in patient's childhood, strongly positive Mantoux test result).

4. A 20-year-old patient complains of severe headache, double vision, weakness, fever, irritability. Objectively: body temperature is 38,1°C, the patient is reluctant to contact, sensitive to stimuli. There are ptosis of the left eyelid, exotropia, anisocoria S>D, pronounced meningeal syndrome. On lumbar puncture the cerebrospinal fluid flowed out under a pressure of 300 mm Hg, the fluid is clear, slightly opalescent. 24 hours later there appeared fibrin film. Protein - 1,4 g/l, lymphocytes - 600/mm³, sugar - 0,3 mmol/l. What is the provisional diagnosis?

A. **Tuberculous meningitis**

B. Meningococcal meningitis

C. Lymphocytic (Armstrong's) meningitis

D. Syphilitic meningitis

E. Mumps meningitis

Correct answer - **Tuberculous meningitis**

A. **Tuberculous meningitis** is also known as TB meningitis or tubercular meningitis. Tuberculous meningitis is *Mycobacterium tuberculosis* infection of

the meninges -the system of membranes which envelop the central nervous system. It cannot be diagnosed or excluded on the basis of clinical findings. The typical CSF abnormalities in patients with TB meningitis are: raised intracranial pressure, raised CSF protein, lymphocytosis, low CSF glucose.

B. **Meningococcal meningitis** belongs to purulent bacterial meningitis, and is characterized by a cloudy (whitish-yellow) character of the cerebrospinal fluid, neutrophils (80-100%) predominate from 1-50 thousand to 10-15 thousand cells in mm^3 , protein content 0.8-16.0 g/l, sugar content reduced to 0.3-0.4 g/l, characterized by the formation of a coarse fibrinous film, often in the form of a precipitate.

C. **Armstrong's lymphocytic meningitis** is characterized by anisoreflexia (asymmetry of the expression of tendon and / or skin reflexes from both sides of the body), pyramidal signs, accommodation disorder. Cerebrospinal fluid analysis: a clear character of the cerebrospinal fluid, lymphocyte character (up to 95%) 100-1500 in 1mm^3 , the protein content is 0.3-0.8 g/l, the sugar content is normal, the formation of a fibrinous film on the surface of the CSF is not typical.

D. **Syphilitic meningitis** (spinal cord, neurosyphilis), which often occurs with secondary recurrence of syphilis, it is characterized by such changes in cerebrospinal fluid: clear, slight pleocytosis is noted, lymphocytes predominate, from 200 to 1000 in 1mm^3 , the amount of protein is normal.

E. **Epidemic mumps** can be classified as serous viral meningitis, which is sometimes characterized by damage to the facial and auditory nerves, ataxia, hyperkinesia, parotitis, CSF analysis: clear, first mixed cytosis, then lymphocyte, 100-1500 mm^3 , protein content 0.33-1.0 g/l, the glucose level within the normal range, the formation of a fibrinous film on the surface of the CSF occurs in 3-5% of cases.

Taken into account CSF abnormalities in this patients, such as opalescent clear cerebrospinal fluid, raised intracranial pressure, raised CSF protein, lymphocytosis, low CSF glucose, appeared fibrin film, it could be concluded final diagnosis tuberculosis meningitis.

5. A 42-year-old woman working at a poultry farm complains of dyspnea, thoracic pain on the left, increased body temperature up to 38-39 ° C in the evening, and

cough. The patient suffers from essential hypertension. Objectively: vesicular respiration in the lungs, vesicular resonance without alterations. X-ray of both lungs reveals numerous small low-intensity foci, 2-3 mm in size, located in a row along the blood vessels. ESR- 32 mm/hour. What is the most likely diagnosis?

- A. **Acute disseminated tuberculosis**
- B. Infiltrative tuberculosis
- C. Pulmonary carcinomatosis
- D. Focal tuberculosis
- E. Community-acquired pneumonia

Correct answer - **Acute disseminated tuberculosis**

A. **Acute disseminated tuberculosis** is characterized by severe signs of intoxication, cough, formation of small low-intensity foci, 1-3 cm in diameter, which is located in both lungs alongside of blood vessels.

B. **Infiltrative tuberculosis** is characterized by a focal shadow which is above 1 cm in diameter, but less than 3 segments (one lobe), which is located in the upper segments S₁ S₂ of the lungs.

C. **Pulmonary carcinomatosis** of the lung radiographically can be manifested by the appearance of single and / or multiple nodes (shadows), carcinomatous lymphangitis, pseudopneumonia and also miliary carcinosis. The most common form of metastases is the rounded shape of the homogeneous nodes, with varying degrees of shadow intensity with a clear or wavy outline. Diameters of metastases vary from 0.3 to 12 cm, but the most frequent diameter of detectable nodes in the lungs is from 2 to 4 cm. Often, the appearance of metastases is accompanied by an inflammatory response of the basal and mediastinal lymph nodes in the form of their increase in size.

D. **Focal (nodular) tuberculosis** is characterized by nodular shadow up to 1 cm in diameter.

E. **Community-acquired pneumonia** often extends to one or two bronchopulmonary segments and usually has a one-sided character. Bilateral changes in non-hospital pneumonia are relatively rare.

According to the indicated clinical signs of severe intoxication and X-ray characteristics of pulmonary pathology (spread bilateral location of small low-intensity, 2-3 mm in diameter shadows alongside of blood vessels) the patient has acute disseminated tuberculosis.

6. A 32-year-old woman complains of general fatigue, low-grade fever persisting for 4 months, lumbar pain, and dysuria. Anamnesis includes frequent acute respiratory

diseases, overexposure to cold, low-calorie diet, a case of pulmonary tuberculosis in childhood. Clinical urine analysis: pH-4,8, leukocyturia, hematuria. Complete blood count: leukocytosis, lymphocytosis, increased ESR. Urography concludes: dilatation of renal pelvis and calyceal system of both kidneys, foci of calcification in the projection of right kidney parenchyma. What is the most likely diagnosis?

- A. **Nephrotuberculosis**
- B. Right renal cyst
- C. Right renal carcinoma
- D. Acute glomerulonephritis
- E. Chronic pyelonephritis

Correct answer - **Nephrotuberculosis**

A. **Nephrotuberculosis** is characterized by the following symptoms: general fatigue, low-grade fever persisting for 4 months, lumbar pain and dysuria. In addition, in favor of a specific process, the previously a case of pulmonary tuberculosis in childhood. As is known, with tuberculosis, there are often calcification, which can be a source of a specific infection for life. With this, the presence of frequent acute respiratory diseases, overexposure to cold, low-calorie diet promotes activation of calcification. Availability leukocyturia, lymphocytosis and increased ESR says more about tuberculosis, which confirms urography concludes: dilatation of renal pelvis and calyceal system of both kidneys, foci of calcification in the projection of right kidney parenchyma.

B. **Renal cyst** – this is a urological disease that is characterized by the formation of a cavity formation surrounded by a capsule of connective tissue filled with liquid. The patient may not feel any discomfort or specific signs at all. A long period of the disease is asymptomatic. For a renal cyst is not typical pulmonary tuberculosis in anamnesis, leukocytosis, leukocyturia, lymphocytosis and increased ESR. Although it can be observed hematuria. With urography, these changes are not observed.

C. **Renal carcinoma** is malignant tumor. Most malignant tumors of the kidney are formed in the renal tubules. This type of cancer is called renal cell carcinoma. Malignant kidney tumor can be characterized as a cell mass that divides uncontrollably and has lost the ability to specialize. The faster the cells of such a tumor are divided, the faster they spread to the lymphatic and blood vessels and the more malignant becomes the formation. The clinical picture depends on the stage of the disease and may be in this patient. But for renal carcinoma is not typical frequent acute respiratory diseases, overexposure to cold, low-calorie diet, a case of pulmonary tuberculosis in childhood in anamnesis. In addition, the clinical analysis of urine and blood is not characterized by the presence leukocyturia, lymphocytosis.

D. **Acute glomerulonephritis** is a disease of an infectious and allergic nature with a predominant defeat of the capillaries of both kidneys. It is widespread everywhere.

Most often sick at the age of 12-40 years, a little more often men. It is characterized by three main symptoms - edematous, hypertonic and urinary. In the urine are found mainly protein and red blood cells. But for him there is no low-calorie diet, a case of pulmonary tuberculosis in childhood in anamnesis, leukocyturia, lymphocytosis. E. **Chronic pyelonephritis** is a chronic nonspecific bacterial process that occurs predominantly involving the interstitial tissue of the kidneys and the bowel-pelvis complexes. Can be manifested by this symptomatology. But it is not characterized by the presence of low-calorie diet, a case of pulmonary tuberculosis in childhood in anamnesis, hematuria and urography data.

Based on the history of pulmonary tuberculosis, factors that reduce immunity, the presence of an intoxication syndrome in the clinic against the backdrop of a slowly developing pain syndrome, data on hematuria and leukocyturia with signs of the transferred tuberculosis process, calcification of the kidney parenchyma and expansion of the bowl-pelvic apparatus, diagnosis of nephrotuberculosis.

7. A 43-year-old man, who has been abusing alcohol and suffering from pulmonary tuberculosis, in the course of two weeks gradually developed general weakness, headache, diplopia, vomiting. Objectively: ptosis on the left, anisocoria S>D, exotropia of the left eye, neck stiffness; Kernig's and Brudzinski's signs are positive. In cerebrospinal fluid: lymphocytic pleocytosis, low glucose, precipitation of cerebrospinal fluid resulted in production of fibrin film. What is the most likely diagnosis?

- A. **Tuberculous meningitis**
- B. Subarachnoid hemorrhage
- C. Brainstem encephalitis
- D. Acute myelitis
- E. Basal arachnoiditis

Correct answer - **Tuberculous meningitis**

A. **Tuberculosis meningitis** in the analysis of cerebrospinal fluid is characterized by lymphocytosis, a decrease in glucose and the formation of a fibrin film. Taking into account the presence of pulmonary tuberculosis, it is possible to diagnose tuberculous meningitis.

B. A **subarachnoid hemorrhage** is characterized by a sharp, sudden headache, often cerebral symptomatology. Subarachnoid hemorrhage is characterized by the presence of blood in the cerebrospinal fluid, therefore this diagnosis can be excluded.

C. **Stem encephalitis** is characterized by vertigo, ataxia, nystagmus, impaired breathing and cardiac activity. The cerebrospinal fluid is characterized by

lymphocytosis without changing the glucose level and without the formation of a fibrin film, so this diagnosis can be excluded.

D. An **acute myelitis** is characterized by the appearance of pathological reflexes, motor and sensory disorders. In the cerebrospinal fluid it is possible to detect protein-cell dissociation. Reducing the level of glucose and the formation of fibrin film for acute myelitis is not typical.

E. **Basal arachnoiditis** is characterized by cerebral and focal symptomatology. In the analysis of cerebrospinal fluid, minor lymphocytic pleocytosis and protein-cell dissociation can be detected. Thus, the clinico-laboratory data described in the task allow to exclude the diagnosis of "basal arachnoiditis."

On the basis of the presence of tuberculosis of other localization, an aggravating factor in the anamnesis - alcoholism, a gradual accumulation of symptoms of the disease, characteristic changes in the cerebro-spinal fluid: a decrease in the amount of glucose less ($\frac{1}{2}$ of its content in the blood), increased protein, lymphocytic pleocytosis, prolapsed fibrin film within a few hours, it is possible to confirm the diagnosis of tuberculous meningitis.