MINISTRY OF HEALTH OF UKRAINE

ODESA NATIONAL MEDICAL UNIVERSITY

Faculty: international, stomatology

Department of occupational pathology and functional diagnostics and phthisiopulmonology

CONFIRMED by

Vice-rector for scientific and pedagogical work

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METHODICAL DEVELOPMENT FOR LECTURES, PRACTICAL CLASSES AND INDEPENDENT WORK OF THE STUDENT IN THE ACADEMIC DISCIPLINE

Faculty: international, 4th year
Educational discipline: phthisiology

Approved:
Meeting of the Department of occupational pathology and functional diagnostics and phthisiopulmonology of Odesa National Medical University

Minutes No. 1 dated 04.09.2023

Head of the Department _____ **Oleksandr IGNATIEV**

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PRACTICAL TRAINING

Practical lesson No. 1

Topic: Epidemiology, etiology, pathogenesis of tuberculosis. Clinical classification of tuberculosis.

Goal: Familiarize yourself with issues of epidemiology of tuberculosis, types of the causative agent and forms of its existence, pathogenesis of primary and secondary forms of tuberculosis, clinical classification of tuberculosis.

Basic concepts: Epidemiology, etiopathogenesis, pathomorphology of tuberculosis, primary and secondary tuberculosis, classification of tuberculosis.

CLINICAL CLASSIFICATION OF TUBERCULOSIS

The principles of creating a classification of tuberculosisclosely related to the achievements of medicine in one or another period of the development of science. The grouping of diseases by a certain sign or a number of signs is carried out for the purpose of unifying the diagnosis and treatment of patients, compiling statistical reports and determining the prognosis of the disease. It corresponds to the International Statistical Classification of Diseases (ICSD) X revision, recommended by WHO since January 1, 1993, approved by Order No. 384 of the Ministry of Health of Ukraine dated 06.09.06.

I. Type of tuberculosis process:

1. Tuberculosis diagnosed for the first time - VDTB.
2. Relapse of tuberculosis - RTB.
3. Chronic tuberculosis - CTB.

II. Clinical forms of tuberculosis:

(IC codes – 10 revisions)

A15.- A16.- Pulmonary tuberculosis (TB)

A15.- A16.- Primary tuberculosis complex A19.-
part Disseminated pulmonary tuberculosis A15.-
A16.- Focal pulmonary tuberculosis
A15.- A16.- Infiltrative pulmonary tuberculosis
A15.- A16.- Caseous pneumonia
A15.- A16.- Tuberculoma of the lungs
A15.- A16.- Fibrous-cavernous pulmonary tuberculosis
A15.- A16.- Cirrhotic pulmonary tuberculosis
A15.- A16./J65 – Pulmonary tuberculosis combined with occupational dust diseases of the lungs (coniotuberculosis)

A15.- A18.- Extrapulmonary tuberculosis (PTB)

A15.- A16.- Tuberculosis of bronchi, trachea, larynx and other upper respiratory tracts
A15.- A16.- Tuberculosis of intrathoracic lymph nodes
A15.- A16.- Tuberculous pleurisy (including empyema)
A17.- Tuberculosis of the nervous system and meninges
A18.0.- Tuberculosis of bones and joints
A18.1.- Tuberculosis of the genitourinary system
A18.2.- Tuberculosis of peripheral lymph nodes
A18.3.- Tuberculosis of intestines, peritoneum and mesenteric lymph nodes

A18.4.- Tuberculosis of the skin and subcutaneous
tissue A18.5.- Tuberculosis of the eye
A18.6.- Tuberculosis of the ear
A18.7.- Tuberculosis of adrenal glands
A18.8.- Tuberculosis of other specified organs and
systems A19.- Miliary tuberculosis
A18.- Tuberculosis of unknown location

III. Characteristics of the tuberculosis process:

1. **Localization of the lesion**
   The localization of the lesion in the lungs is indicated by the number (name) of the segments, the name of the lobes of the lung; and in other organs and systems - by the anatomical name of the lesion site.
2. **Presence of**
   destruction(Destr+) available
   destruction(Destr-) does not
   exist destruction
   Optionally, the phase of the tuberculosis process should be noted:

- infiltration, decay, insemination;
- resorption, compaction, scarring, calcification (calcification).

3. **Etiological confirmation of the diagnosis of tuberculosis**
   (MBT+) confirmed by the results of a bacteriological examination (code A15), in this case specify:
   (M+) positive smear test result for acid-fast bacteria (CBS); (K0) cultural research
   was not conducted;
   (K-) negative result of cultural research;
   (K+) positive result of cultural research; in this case, specify the resistance
   (Hist0) histological examination was not performed;
   (Hist-) not confirmed by the results of a histological examination (code A16); (Hist+)
   confirmed by the results of histological examination (code A15). IV. Complications of
   tuberculosis:
   Complications of pulmonary tuberculosis (TB):hemoptysis, pulmonary hemorrhage, spontaneous pneumothorax, pulmonary insufficiency, chronic pulmonary heart disease, atelectasis, amyloidosis, etc.
   Complications of extrapulmonary tuberculosis (PTB):bronchial stenosis, pleural empyema, fistula (bronchial, thoracic), renal (adrenal) failure, infertility, adhesions, ankylosis, amyloidosis, etc.
   V. Clinical and dispensary category of patient
   registration. VI. Effectiveness of treatment of patients
   with tuberculosis VII. Consequences of tuberculosis:
   Residual changes after cured pulmonary tuberculosis:fibrotic, fibrotic-focal, bullous-dystrophic, calcifications, pleuropneumosclerosis, cirrhosis, consequences of surgical intervention (indicating the type and date of surgery), etc.
   Residual changes after cured extrapulmonary tuberculosis:cicatricial changes in various organs and their consequences, calcification, consequences of surgical intervention (indicating the type and date of surgery).

Equipment:laptop with presentation, multimedia projector

Plan:

1. Organizational measures(greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

2. Control of the reference level of knowledge(written work, written test, frontal survey on basic terminology, etc.) (if necessary).

3. Question(test tasks) to check basic knowledge on the topic of the practical lesson:

1. The child had contact with his father, who was suffering from destructive pulmonary tuberculosis. During the examination at the tube dispensary, the child was found to have a tuberculin test - an infiltrate of 15 mm in diameter. Probable route of infection?

A. Contact B.
Aerogenic S.
Sexual
D. Alimentary
E. Transplacental

2. A 7-year-old child fell ill with the primary form of tuberculosis. Which of these forms is primary according to clinical classification?

A. Focal tuberculosis
B. Primary tuberculosis complex S.
Tuberculoma of the lungs
D. Infiltrative tuberculosis E.
Caseous premonia

3. After a 6-month course of treatment in the hospital, the patient was discharged with the diagnosis: "Focal tuberculosis of the right upper lobe in the phase of resorption and calcification. MBT(-)" What bacterial subpopulations of MBT prevail in the remaining foci?

A. Actively - reproducing. B.
Slowly metabolizing.
C. Persistent L-forms. D.
Alpha forms.
E. Ultra-small forms.

Clinical tasks:

Task No. 1 In a 30-year-old patient, a round shadow up to 5 cm in diameter, of medium intensity with clear even contours and a sickle-shaped light was detected by fluorography in the II segment of the right lung. In the surrounding lung tissue and in the lower lobe on the right, individual low-intensity focal shadows are determined. MBT was detected in the sputum. A diagnosis of tuberculosis was established.

Question:

1.What is the form of the tuberculosis process?

2. What is the phase of the
process? Standards of answers:

1. secondary tuberculosis 2.
phase of decay and
insemination

Task No. 2. Patient. 38 years old. He complains of an increase in body temperature up to 37.2ºC, weakness, increased sweating, cough with sputum. Radiologically, in S1, 2, 3 of the right lung, an infiltrative shadow with a decay cavity and foci of insemination were determined in S6 of a healthy lung. Tuberculosis mycobacteria were found in the sputum. The patient was clinically diagnosed with tuberculosis.

Question:

1. Which diagnosis fully corresponds to the classification?

2. What phase does the abbreviation Destr+ correspond to? Standards of answers:

1. VDTB (12.10.2022) of the upper lobe of the right lung (infiltrative), Destr+, MBT+M+K+ ResistI0 Resist110, HISTO, Cat1Cog1 (2022)
2. Phases of decay

4. Discussion of theoretical issues:

1. What is tuberculosis as a disease? Give a definition.
2. What are the negative trends in the epidemiological situation of tuberculosis in Ukraine?
3. What types of MBT cause tuberculosis in humans and animals?
4. What are the main properties of MBT?
5. What are the main ways of infecting a person with tuberculosis?
6. What morphological changes occur in the focus of tuberculous inflammation?
7. What is the L-transformation of MBT?
8. What clinical forms are primary forms?
9. What clinical forms are secondary forms?
10. What phases characterize the activity of tuberculosis changes in patients?
11. What phases reflect the subsidence of active tuberculosis?

Note. The discussion of theoretical issues can take place in the form of answers to the questions posed, debates, discussions, presentations with reports, abstracts, discussion of reports and abstracts, review of the answers of students of higher education, etc.

5. Topics of reports/abstracts:

- modern epidemiological situation in Ukraine and Odesa region;
- the history of the discovery of the causative agent of tuberculosis;
- explanation of the modern classification of tuberculosis

Note. When preparing a report, essay, analytical review, etc., students of higher education can, along with this, prepare didactic visual materials in the form of tables, code diagrams, slides, drawings, drug schemes, etc.

6.Summing up

7. **List of recommended literature (main, additional, electronic information resources).**

Main:

1. Phthysiatry: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others] ; under the editorship V. I. Petrenko. Kyiv: Medicine, 2015. 471 p.
2. Phthisiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. – Kharkiv: KhNMU, 2016. – 176 p.,

Additional: History of teaching about tuberculosis: [manual] / Yu. I. Feshchenko, V. M. Melnyk; National Institute of Phthisiology and Pulmonology named after F. G. Yanovsky. — Kyiv: Lira-K, 2016. — 141 p. : illustration, photo. — Bibliogr.: p. 134—140

1. Order on the specialty "Physiology" "On the approval of health care standards for tuberculosis dated February 25, 2020 No. 530 (as amended by the order of the Ministry of Health of Ukraine dated October 6, 2021 No. 2161) HEALTH CARE STANDARDS FOR TUBERCULOSIS.

2. Tuberculosis in Ukraine: Analytical and statistical guide for 2020/CGZ. – K. 2020.-197p.

Electronic information resources:

1.www.dec.gov.ua/mtd/dodatki/2016_729_VGC/2016_729_YKPMD_VGC.doc

2.http://www.ifp.kiev.ua/doc/people/tubzar.htm

Practical lesson No. 2

Topic: Organization, detection and diagnosis of tuberculosis. The role of the anti-tuberculosis dispensary. Tuberculin diagnosis. Clinical analysis of patients.

Goal. To teach students of higher education to identify population categories with an increased risk of tuberculosis, to identify criteria for early diagnosis of tuberculosis of the respiratory organs and extrapulmonary localization

Basic concepts: Criteria for the early diagnosis of tuberculosis, the role of the anti-tuberculosis dispensary in the detection of tuberculosis; the role of tuberculin diagnostics in timely detection of tuberculosis

Equipment:a laptop with a presentation, a multimedia projector, individual tasks on the topic of a practical lesson

Plan:

1. Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).
2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

- Collect history (especially epi-history) and establish risk factors for tuberculosis.
- Collect complaints and identify signs that are characteristic of tuberculosis.
- Conduct an objective examination of a patient suspected of tuberculosis (examination, palpation, percussion, auscultation).
- .Make an individualscheme of the next examination of the patient (select the mandatory diagnostic minimum, additional and optional methods of examination).
- Divide the contingent of patients according to the categories of dispensary supervision
- Tuberculin diagnostics as a special method of detecting and diagnosing tuberculosis

3. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.)

1.The patient was diagnosed with tuberculosis 2 years ago. With the diagnosis: Disseminated tuberculosis of the lungs, the phase of infiltration and decay, MBT (+) was treated for 7 months in the tube. hospital, discharged with effect. He was under the supervision of the phthisiologist of the district anti-tuberculosis dispensary. He took prophylactic chemotherapy courses irregularly, abused alcohol. An exacerbation of the process has now been detected. To which category of dispensary supervision should this patient be assigned?
+A.1
B.2
P.3
D.4
E. 5

2.The patient has been suffering from fibro-cavernous tuberculosis of the lungs for 7 years. It is under the supervision of the district anti-tuberculosis dispensary in category 4. What are the deadlines for treatment and observation of patients in this category?
+A. Not limited by time
B. 2 years
S. 3 years
D. 4 years
E. 10 years

3. Patients suffering from diabetes, CKD, peptic ulcer disease of the stomach and duodenum, alcoholism are a risk group for tuberculosis. How often should they undergo preventive FG examinations?
+A. 1 time a year
B. 2 times a year
C. 1 time in 2 years D. 1 time in 3 years E. 1 time in 4 years

4.The child was not BCG vaccinated during the newborn period. In which dispensary registration group should she be observed before vaccination?
A.1
B. 2.
P. 3.
D. 4.
+E.5.

5. A 20-year-old patient was treated for 6 months in a tuberculosis hospital with the diagnosis: Miliary tuberculosis of the lungs, infiltration phase, MBT (-). What category of dispensary supervision does this patient belong to?
+A.1
B.2
P.3
D.4
E. 5

6.Patient K., 38 years old, was undergoing inpatient treatment for infiltrative pulmonary tuberculosis in the decay phase, MBT (+). In which category of dispensary supervision will this patient be observed after discharge from the hospital?
+A.1
B.2
P.3
D.4
E. 5

7. Patients suffering from diabetes, CKD, peptic ulcer disease of the stomach and duodenum, alcoholism are a risk group for tuberculosis. How often should they undergo preventive FG examinations?
+A. 1 time a year
B. 2 times a year
C. 1 time in 2 years D. 1 time in 3 years
E. 1 time in 5 years

8.The child has a tuberculin test curve. After the examination, it was found that the child is healthy. In which group of dispensary records should it be observed?
A.1
B. 2.
P. 3.
D. 4.
+E.5.

4. Discussion of theoretical issues:

1. What categories of the population are risk groups for tuberculosis? 2. State the signs of tuberculosis.

3. What symptom complexes require mandatory examination for tuberculosis? 4. What are the criteria for diagnosing tuberculosis?

5.What is the scope of examinations used to diagnose pulmonary tuberculosis?

6. What are the categories of dispensary supervision?

7. Give the characteristics of tuberculins.

8. What is the Mantoux test technique?

19. To evaluate the result of the Mantoux test with 2 TO according to qualitative and quantitative indicators.

Note. The discussion of theoretical issues can take place in the form of answers to the questions posed, debates, discussions, presentations with reports, abstracts, discussion of reports and abstracts, review of the answers of students of higher education, etc.

5. Topics of reports/abstracts:
- the current state of dispensary supervision in Ukraine
- clinical signs of pulmonary tuberculosis
- clinical signs of pulmonary tuberculosis
- the history of tuberculin tests

Note. When preparing a report, essay, analytical review, etc., students of higher education can, along with this, prepare didactic visual materials in the form of tables, code diagrams, slides, drawings, drug schemes, etc.

6.Summing up

7. List of recommended literature (main, additional, electronic information resource):

Main:

1.Phthysiatry: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others] ; under the editorship V. I. Petrenko. Kyiv: Medicine, 2015. 471 p.

2. Phthisiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. – Kharkiv: KhNMU, 2016. – 176 p.,

Additional:

1.History of teaching about tuberculosis: [manual] / Yu. I. Feshchenko, V. M. Melnyk; National Institute of Phthisiology and Pulmonology named after F. G. Yanovsky. — Kyiv: Lira-K, 2016. — 141 p. : illustration, photo. — Bibliogr.: p. 134—140

2.Order on the specialty "Physiology" "On the approval of health care standards for tuberculosis dated February 25, 2020 No. 530 (as amended by the order of the Ministry of Health of Ukraine dated October 6, 2021 No. 2161) HEALTH CARE STANDARDS FOR TUBERCULOSIS.

Electronic information resources:

1.www.dec.gov.ua/mtd/dodatki/2016_729_VGC/2016_729_YKPMD_VGC.doc

2.http://www.ifp.kiev.ua/doc/people/tubzar.htm

Practical lesson 3

Topic: General clinical methods of diagnosis of tuberculosis. Special diagnostic methods (laboratory, x-ray). Clinical analysis of patients.

Goal: Acquaint applicants with general clinical and special methods of diagnosing tuberculosis, including methods of bacterioscopic, bacteriological examination of sputum and functional and instrumental diagnostics of organs of the cardiorespiratory system.

Basic concepts: Scheme of examination of a patient with tuberculosis: features of epidanamnesis; physical examination, laboratory and special instrumental diagnostics,

Equipment: a laptop with a presentation, a multimedia projector, individual tasks on the topic of a practical lesson

Plan:

1. Organizational activities (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

2. Control of the reference level of knowledge (written work, written test, frontal survey, etc.) (if necessary):

- Peculiarities of the clinical examination of a patient with tuberculosis (complaints, anamnesis data, objective examination).
- 2. Laboratory methods of diagnosing tuberculosis.
- 3. Methods of x-ray diagnosis of tuberculosis

3.. Formation of professional skills and abilities (mastery of skills, conducting curation, determining the treatment scheme, conducting laboratory research, etc.)

1.In the patient, during the fluorographic examination according to the FG plan, an area of inhomogeneous darkening was found under the clavicle on the right. What additional x-ray examination of the lungs should be performed?
A. Overview X-ray B.
Lateral X-ray
+V. Roentgenogram H.
Roentgenoscopy
D. Target X-ray

2. The doctor received the result of a blood test from a tuberculosis patient. What hemogram indicators are characteristic of this disease?
A. Leukopenia, lymphocytosis, eosinopenia.
+B. Leukocytosis, lymphopenia, monocytosis.
B. Monocytopenia, leukopenia, lymphopenia.
G. Leukocytosis, lymphocytosis, eosinopenia.
D. Leukocytosis, monocytosis, lymphocytosis.

3.The patient passed an analysis of sputum for the presence of KSP. What amount of KSP should be in 1 ml of sputum so that it can be detected by bacterioscopy?
A. 10 – 100
B. 200 - 1000
V. 1000 - 2000
G. 500 - 1000
+D. 50,000 - 100,000

4.What are the pathognomonic symptoms of pulmonary tuberculosis? A.
Weight loss, subfibrillation, sweating.
B. Cough, expectoration. V. Shortness of
breath, chest pain. G. Presence of
hemoptysis.
+ D. None.

5.A patient who complains of a cough for a month turned to the family doctor. The temperature is normal. No pathological changes were detected during the objective examination. What is the further plan of examination of the patient?
A. General blood and urine analysis, sputum analysis for KS and microflora, FG. B.
General analysis of blood and urine, sputum culture at MBT, FG.
S. General analysis of blood and urine, analysis of sputum for microflora, FG.

D. Analysis of sputum for KS and microflora, FG. E.
General analysis of blood and urine, FG.

4. Discussion of theoretical issues:

1. To review the methods of diagnosis of tuberculosis.
2. What data in the anamnesis of a patient with tuberculosis should be paid attention to?
3. What changes are detected during an objective examination of a patient with tuberculosis7
4. What two symptom complexes are found in patients with tuberculosis?
5. What methods of examining sputum for the presence of MBT do you know? 6. To describe the bacterioscopic method of determining KSP.
7 To describe the bacteriological method of detecting MBT.
8. How to differentiate post-vaccination and infectious allergies? 9. What causes the lung pattern on the X-ray?
10. What X-ray signs are characteristic of tuberculosis of the respiratory organs?
11. What methods of X-ray examination are mandatory for the diagnosis of tuberculosis? Note. The discussion of theoretical issues can take place in the form of answers to the questions posed, debates, discussions, presentations with reports, abstracts, discussion of reports and abstracts, review of the answers of students of higher education, etc.

5. Topics of reports/abstracts:
- modern laboratory methods of diagnosis of tuberculosis
- modern instrumental methods of diagnosis of tuberculosis
-differential diagnosis of Mantoux test and gamma interferon release test

6.Summing up

7. List of recommended literature (main, additional, electronic information resources):
Main:
1.Phthysiatry: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others] ; under the editorship V. I. Petrenko. Kyiv: Medicine, 2015. 471 p.
2. Phthisiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. - Kharkiv: KhNMU, 2016. - 176 p

Additional:

1. Prevention of tuberculosis. Study guide for students and interns of VNMZ IV accreditation level and doctors / V. I. Petrenko, M. G. Dolynska, A. V. Aleksandrin, V. V. Petrenko. Kyiv: 2 Print, 2017. 88 p.2.Order on the specialty "Physiology" "On the approval of health care standards for tuberculosis dated February 25, 2020 No. 530 (as amended by the order of the Ministry of Health of Ukraine dated October 6, 2021 No. 2161) HEALTH CARE STANDARDS FOR TUBERCULOSIS.
Electronic information resources:
1.www.dec.gov.ua/mtd/dodatki/2016_729_VGC/2016_729_YKPMD_VGC.doc
2.http://www.ifp.kiev.ua/doc/people/tubzar.htm

Practical lesson 4

Topic. General principles of treatment. Antimycobacterial drugs. Treatment of tuberculosis of the mucous membrane of the oral cavity and jaw bones. Side effects of antituberculosis drugs. Clinical analysis of patients.

Goal. To acquaint students of higher education in the specialty "dentistry" with the principles of prescribing general and special antimycobacterial therapy for tuberculosis of the mucous membrane of the oral cavity and jaw bones.

Basic concepts: general principles of treatment of tuberculosis patients; familiarize yourself with the general principles of chemotherapy, modern WHO recommendations for the treatment of tuberculosis; familiarize yourself with the contribution of domestic scientists, the developments of the department's employees in the treatment of tuberculosis patients; be able to explain to the patient the need for timely and long-term treatment of tuberculosis.

Equipment:a laptop with a presentation, a multimedia projector, individual tasks on the topic of a practical lesson

Plan:

1. Organizational measures(greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

2. Control of the reference level of knowledge(written work, written test, face-to-face survey, etc.) (if necessary):

- General approaches to the treatment of respiratory tuberculosis.
- Basic principles of antituberculosis chemotherapy.
- Categories of treatment of patients.
- .Standard regimens of chemotherapy according to categories.
- Classification of antituberculosis drugs.
- Mechanism of action, doses, routes of administration of anti-tuberculosis drugs.
- Side effects of antituberculosis drugs and methods of prevention of side reactions.
- Criteria for curing tuberculosis.

3.Formation of professional skills, skills (mastery of skills, conducting curation, determining the treatment regimen, conducting laboratory research, etc.).

1. The patient, who is being treated for infiltrative pulmonary tuberculosis, developed a sleep disorder, depression, and polyneuritis. This is related to the reception:

A. Rifampicin
+V. Pyrazinamide
S. Ethionamide
D. Streptomycin E.
Isoniazid

2.To the complex therapy of a patient withtuberculosis turned on isoniazid With which method of administration of the drug will its highest bactericidal concentration be created?

A. Oral

V. Endolumbarny
+S. Intravenous D.
Endopleural
E. Intramuscular

3.The patient, who was admitted to the hospital for treatment, was prescribed complex chemotherapy. What is an absolute contraindication to the appointment of streptomycin?

A. Diabetes B.
Hepatitis
C. Hypertensive disease
D. Pyelonephritis
+E. Damage to the VIII pair of cranial nerves

4. A 9-year-old child was admitted to the children's department of the hospital with a diagnosis of "Tuberculosis of the intrathoracic lymph nodes in the infiltration phase." There is a history of tube contact. What chemotherapy drugs should be prescribed to the child?

A. Isoniazid + ethambutol + PASK + streptomycin
B. Isonifazid + streptomycin + tibon + ethambutol
C. Rifampicin + PASK + isoniazid + ethambutol D.
Phtivazid + tibon + kanamycin
+E. Isoniazid + rifampicin + pyrazinamide + ethambutol

5. A 25-year-old patient was admitted to an anti-tuberculosis hospital for disseminated pulmonary tuberculosis. He was prescribed a standard treatment scheme according to the 1st category. The weight of the patient is 60 kg. What average daily dose of isoniazid should be taken by the patient?

A. 0.1 g
B. 1.5 g
P. 1.0 g
D. 0.6 g
+E. 0.3 g

6.Patient K., 42 years old, suffers from fibro-cavernous tuberculosis combined with alcoholism and chronic hepatitis. Which drug has a pronounced hepatotoxic side effect?

A. Isoniazid.
B. Streptomycin
+ S. Rifampicin
D. Ethambutol
E. PASK.

7.A patient with infiltrative pulmonary tuberculosis is prescribed 5 antituberculosis drugs. Which of the listed drugs has a side effect on the optic nerve?

A.
PyrazinamideB.
Rifampicin
+S. Ethambutol
D.
StreptomycinE.
Isoniazid

8. Patient, 32 years old. He was admitted to the hospital of the anti-tuberculosis dispensary with complaints of a periodic increase in body temperature up to 37.0ºC, weakness. After X-ray and laboratory tests, the diagnosis was established: VDTB (15.02.2005) of the upper lobe of the right lung (focal, infiltration phase), Destr-, MBT-M-K- ResistIORResistII0, HISTO, Cat3Kog4(2005). What treatment regimen should be prescribed to the patient?

+A.HRZE
B.HZES
C.RZEEt
D.HRZ
E.ZESPt

9. The patient is 40 years old. She was admitted to the inpatient tuberculosis dispensary with complaints of cough with sputum, weakness, and an increase in body temperature up to 37.3ºC. For the first time, pulmonary tuberculosis was detected 4 years ago. After successful treatment, clinical well-being was noted in the next 3 years. An infiltrative shadow of an inhomogeneous structure is determined in the upper part of the left lung on the X-ray examination and tomograms. In the sputum, MBT was detected, sensitive to all antimycobacterial drugs of the first series. What treatment regimen does the patient need in the intensive phase?

A. HRZPtQ
+B.HRZE
C.RZEEt
D.HRZ
E.ZESPt

10.The patient was diagnosed with focal tuberculosis of the upper lobes of the lungs. Anti-tuberculosis therapy was prescribed. After taking the drugs for two weeks, the patient developed yellowness of the sclera, nausea, and pain in the right hypochondrium. In the biochemical analysis of blood, an increase in the content of AsAT and AlAT was revealed. Which of these drugs is most likely to cause complications?

+A. Rifampicin
V. Isoniazid
S. Streptomycin
D. Ethambutol
E. Pyrazinamide

4. Discussion of theoretical issues:

1.What are the common approaches to treating tuberculosis?
2.What are the main principles of antituberculosis chemotherapy? 3. What are the main courses of chemotherapy?
4. What are the categories and treatment regimens for tuberculosis patients? 5. Classification of antituberculosis drugs.
6. Mechanism of action, doses, ways of introducing anti-tuberculosis drugs into the body. 7. What are the side effects of anti-tuberculosis drugs, their diagnosis and prevention?
8. Criteria for curing tuberculosis.

Note. The discussion of theoretical issues can take place in the form of answers to the questions posed, debates, discussions, presentations with reports, abstracts, discussion of reports and abstracts, review of the answers of students of higher education, etc.

5. Topics of reports/abstracts:
-pharmacological properties of the main anti-tuberculosis drugs
- modern antituberculosis drugs for the treatment of MDR-TB
- Treatment of tuberculosis of the mucous membrane of the oral cavity and jaw bones

6.Summing up

7. List of recommended literature (main, additional, electronic information resources):
Main:
1.Phthysiatry: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others] ; under the editorship V. I. Petrenko. Kyiv: Medicine, 2015. 471 p.
2. Phthisiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. - Kharkiv: KhNMU, 2016. - 176 p
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Electronic information resources:
1.www.dec.gov.ua/mtd/dodatki/2016_729_VGC/2016_729_YKPMD_VGC.doc
2.http://www.ifp.kiev.ua/doc/people/tubzar.htm

. Practical lesson 5.

Topic: Prevention of tuberculosis. Dispensary supervision. Clinical analysis of patients.

Goal. Familiarize applicants with the questionsprevention of tuberculosis

Basic concepts: types of tuberculosis prevention (specific, non-specific), purpose, indications and method of chemoprophylaxis, methods of BCG vaccination and revaccination, history of invention of BCG vaccine, indications, contraindications to vaccination, complications of vaccination

Equipment:a laptop with a presentation, a multimedia projector, individual tasks on the topic of a practical lesson
Plan:
1. Organizational measures(greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).
2. Control of the reference level of knowledge(written work, written test, face-to-face survey, etc.) (if necessary):

- Types of anti-tuberculosis preventive measures.
- .Peculiarities of receiving the BCG vaccine, its storage conditions, dilution, assessment of suitability for use.
- Indications and contraindications for BCG vaccination and revaccination.
- Terms of BCG vaccination and revaccination.
- Manifestations of post-vaccination complications.
- .Indications for chemoprophylaxis of tuberculosis among childrenand teenagers the methodology of its implementation.

3.Formation of professional skills and abilities(mastery of skills, conducting curation, determining the treatment regimen, conducting laboratory research, etc.).

1. A healthy baby weighing 3 kg 200 g was born in the maternity hospital. Vaccination against tuberculosis will be carried out:
A. BCG vaccine in a dose of 0.5 mg
+V. BCG vaccine at a dose of 0.05 mg C. BCG vaccine at a dose of 0.005 mg D. BCG vaccine at a dose of 0.025 mg E. BCG vaccine at a dose of 0.1 mg

2. A 5-year-old girl lives in the center of a tuberculosis infection. Mantoux sample with 2 TO - infiltrate with a diameter of 14 mm. There are no complaints. No pathological changes were detected during the objective examination and on the X-ray examination of the chest organs. What tactics are appropriate in addition to dispensary surveillance?
+A. Appointment of chemoprophylaxis
B. BCG revaccination
C. Appointment of vitamins
D. Appointment of immunostimulants
E. Prescribing anti-inflammatory drugs

3. Boy, 10 months. He was born with a birth injury, which is why he was not vaccinated with the BCG vaccine. What examination must be done before vaccination if there are no contraindications?
A. X-ray of chest organs B. Koch test
S. General blood analysis
+D. Mantoux test with 2 TO
E. Determination of immunogram

4. A 24-year-old woman with focal tuberculosis of the upper lobe of the right lung in the phase of infiltration and disintegration of MBT(+) gave birth to a full-term, healthy baby weighing 3500 g. After birth, the baby was immediately isolated from the sick mother. What should be the tactics of the doctor in relation to the child?
A. Carry out chemoprophylaxis with isoniazid
+V. Vaccinate with BCG vaccine
C. Make an X-ray of the chest organs

D. Do not vaccinate with BCG vaccine E.
Carry out a Mantoux test with 2 TO PPD-L

5. Child, 4 days after birth, weighing 3 kg. healthy What is the route of administration of the BCG vaccine to this child:

A. Orally
B. Intramuscularly
+V. Intradermally G.
Subcutaneously
D. All the above ways are used

6. A 4-year-old child has contact with his father, who is suffering from an active form of tuberculosis. She was examined in an anti-tuberculosis dispensary. The curve of the tuberculin sample was determined. Chemoprophylaxis is prescribed. Chemoprophylaxis of children with "virage" is carried out:

A. Ethambutol 6 months B.
Streptomycin 2 months C.
Rifampicin 6 months D.
Isoniazid 3 months
+D. Isoniazid for 6 months

7. The child is vaccinated on time. After 3 months, there were complaints of pain and a tumor-like formation in the left axillary region, an increase in body temperature to 37.2 0 C. Objectively: a tumor-like formation up to 1.5 cm in diameter was found in the left axillary fossa. A likely diagnosis?

+A. Post-vaccine lymphadenitis B.
Lymphogranulomatosis
B. Sarcoidosis
G. Purulent nonspecific lymphadenitis D.
Axillary hidradenitis

8. A patient with an open form of tuberculosis is hospitalized in a tuberculosis hospital. Who should carry out final disinfection at the patient's place of residence?

A. Employees of SES.
+V. By members of the patient's family.
S. Medical staff of the anti-tuberculosis dispensary. D.
Medical staff of the district polyclinic
E. Medical staff of the tuberculosis hospital.

9. Students of higher education institutions undergo annual medical examinations. What method of research is carried out by them for the purpose of early detection of tuberculosis?

+A. FG of chest organs
B. X-ray of chest organs C. CT scan of chest
organs.
D. TG of chest organs.
E. Radiography of chest organs.

10. A healthy person was in long-term contact with a tuberculosis patient and is under the supervision of an anti-tuberculosis dispensary. What drug should she use for chemoprophylaxis?

A. PASK
V. Rifampicin
S. Ethambutol
+ D. Isoniazid
E.
Pyrazinamide

11. The 27-year-old girl was in contact with her mother, who was suffering from tuberculosis. She was examined in an anti-tuberculosis dispensary. Mantoux's reaction with 2 TO is doubtful. There are no clinical manifestations of the disease. X-ray examination of the lungs revealed no pathological changes. Chemoprophylaxis is prescribed. What dose of isoniazid should she be prescribed?

A. 1 mg/kg body weight
+V. 5 mg/kg body weight C. 15 mg/kg body weight D. 12 mg/kg body weight E. 7 mg/kg body weight

4. Discussion of theoretical issues:

1. What types of measures are included in the prevention of tuberculosis?
2. What is social prevention aimed at?
3. What is meant by the term "infection control"?
4. What are the goals of sanitary prevention?
5. On the basis of what criteria are foci of tuberculosis infection distributed?
6. What is the characteristic of groups of foci of tuberculosis infection according to the degree of epidemiological danger?
7. What is BCG vaccine?
8. What is the route of administration of the BCG vaccine, what are the stages of formation of the post-vaccination sign?
9. What are the terms of development of immunity after BCG vaccination, characteristics of post-vaccination immunity?
10. At what age is BCG vaccination carried out?
11. What are the contraindications to BCG vaccination?
12. What are the complications of BCG vaccination?
13. What are the doctor's tactics regarding children with post-vaccination complications?
14. What is the method of chemoprophylaxis, to which categories is it prescribed?

5. Topics of reports/abstracts:

- history of BCG vaccine invention
- BCGs and their treatment
- contraindications to BCG vaccination

Note. The discussion of theoretical issues can take place in the form of answers to the questions posed, debates, discussions, presentations with reports, abstracts, discussion of reports and abstracts, review of the answers of students of higher education, etc.

6.Summing up

7. List of recommended literature (main, additional, electronic information resources):

Main:

1.Phthysiatry: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others] ; under the editorship V. I. Petrenko. Kyiv: Medicine, 2015. 471 p.
2. Phthisiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. - Kharkiv: KhNMU, 2016. - 176 p

Additional:

1. Prevention of tuberculosis. Study guide for students and interns of VNMZ IV accreditation level and doctors / V. I. Petrenko, M. G. Dolynska, A. V. Aleksandrin, V. V. Petrenko. Kyiv: 2 Print, 2017. 88 p.2.Order on the specialty "Physiology" "On the approval of health care standards for tuberculosis dated February 25, 2020 No. 530 (as amended by the order of the Ministry of Health of Ukraine dated October 6, 2021 No. 2161) HEALTH CARE STANDARDS FOR TUBERCULOSIS.

Electronic information resources:

1.www.dec.gov.ua/mtd/dodatki/2016_729_VGC/2016_729_YKPMD_VGC.doc
2.http://www.ifp.kiev.ua/doc/people/tubzar.htm

Practical lesson 6

Topic: Pulmonary tuberculosis: primary forms. Clinical analysis of patients.

Goal: To acquaint the students of higher education in the specialty "dentistry" with the issue of primary forms of tuberculosis.

Basic concepts: Get acquainted with the pathogenesis of the primary forms of tuberculosis, the peculiarities of their course at the present stage, the forms, the peculiarity of the X-ray picture of each form, methods of diagnosis, the causes of complications and their prevention.

Equipment:a laptop with a presentation, a multimedia projector, a negatoscope, a set of radiographs

Plan: individual tasks on the subject of practical lessons: primary forms tuberculosis

1. Organizational measures(greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

2. Control of the reference level of knowledge(written work, written test, face-to-face survey, etc.) (if necessary):

- Etiology, pathogenesis of primary forms of tuberculosis in children and adolescents,
- the clinical picture of the pathogenesis of primary forms of tuberculosis in children and adolescents (virage, tube intoxication, primary tuberculosis complex, tuberculosis of the intrathoracic lymph nodes),
- peculiarities of the course of primary forms of tuberculosis in children and adolescents
- consequences (of primary forms of tuberculosis in children and adolescents
- compilation of primary forms of tuberculosis in children and adolescents

3.Formation of professional skills and abilities(mastery of skills, conducting curation, determining the treatment regimen, conducting laboratory research, etc.).

1. A child from a tuberculosis outbreak was admitted to the children's department of a tuberculosis hospital because of a primary tuberculosis complex. X-ray: on the right in the 2nd segment, a focus of shading of medium intensity 2x2 cm with indistinct edges, connected by a "track" to the root, enlarged basal lymph nodes on the right. Determine the stage of the primary tuberculosis complex.
A. Pneumonic
+V. Bipolarity (resorption) C.
Sealing.
D. Calcification
E. Fibrotization

2.A 3-year-old child, while receiving specific therapy in a tuberculosis hospital for right-sided tumorous bronchoadenitis, developed shortness of breath, cyanosis, and increased dry cough. During X-ray control, the upper part on the right is shaded, reduced in volume, the organs of the mediastinum are shifted to the right. What complication did the child have?
A. Pneumonia
+V. Atelectasis
S. Apical pleurisy.
D. Miliary tuberculosis of the lungs. E. Asbestosis of the lungs.

3.A 5-year-old girl fell ill a week ago. The mother notes poor appetite, irritability, rapid fatigue, dry cough, mainly at night, an increase in body temperature to 37.50 C. An objective examination revealed an increase in cervical, supraclavicular and axillary lymph nodes, hypertrichosis. Breathing is vesicular, heart sounds are clear. On the X-ray examination, the lung fields are transparent, there is intense darkening in the right root. No one in the family had tuberculosis, last year the Mantoux reaction was negative, this year it has not been done yet. What is the most likely clinical diagnosis for the child?
A.
Lymphogranulomatosis
B. Acute pneumonia
S. Tumor of the right main bronchus D.
Sarcoidosis
+E. Tuberculosis of intrathoracic lymph nodes

4.The patient is 16 years old. X-ray examination revealed a shadow of medium intensity without clear contours in the posterior segment of the right lung, which is connected to the root of the lung. On the tomogram, there is an increase in the tracheobronchial lymph nodes. In the blood analysis: Hb - 130 g/l, ESR - 30 mm/h, L - 5.3 g/l, lymphopenia, monocytosis. MBTs were not detected in sputum. What diagnosis most likely corresponds to the detected radiological changes?
A. Eosinophilic infiltrate B.
Peripheral lung cancer C.
Focal pneumonia
D. Sarcoidosis

+E. Primary tuberculosis complex

5.A 10-year-old child had a low-grade fever, decreased appetite, and rapid fatigue for 1.5 months. At the time of the examination, the Mantoux test with 2 TO was positive for the first time (papule - 12 mm). Enlarged peripheral lymph nodes in 6 groups of soft elastic consistency are palpated. X-ray changes of chest organs were not detected. What is the clinical form of tuberculosis in a child?
A. Tuberculosis of intrathoracic lymph nodes
+V. Tuberculosis intoxication S.
Viraj tuberculin test
D. Primary tuberculosis complex E.
Infection of MBT

6.Schoolboy, 13 years old. Got sick a month ago. A dry cough appeared, fatigue increased, appetite worsened, performance at school decreased. He has been registered for a tuberculin test for 8 months. Objectively: the skin is pale, the peripheral lymph nodes are enlarged to the size of beans, painless, soft. Mantoux sample with 2 TO - infiltrate with a diameter of 17 mm. Blood analysis: L - 10.0x10.9/l, ESR - 30 mm/h. On the X-ray of the lungs, the right root is expanded to 3 cm, the outer contour is blurred. What is the most likely diagnosis?
A. Sarcoidosis of intrathoracic lymph nodes B.
Primary tuberculosis complex
S. Tuberculous intoxication D.
Lymphogranulomatosis
+E. Tuberculous bronchoadenitis

7.A 14-year-old patient was admitted to the anti-tuberculosis hospital due to tuberculous bronchoadenitis. After 5 days, the condition worsened sharply: chest pain appeared on the right, shortness of breath, symptoms of intoxication increased. Percussion - dullness on the right from the 3rd rib to the bottom, there is also weakened breathing. What complication of tuberculous bronchoadenitis occurred in the patient?
A. Pleuropneumonia.
+ V.
Pleurisy.
S. Atelectaz.
D. Broncho-nodular fistula. E.
Lung infarction.

9. A 9-year-old child was admitted to the children's ward of the inpatient hospital with a diagnosis of "Tuberculosis of the intrathoracic lymph nodes in the infiltration phase." There is a history of tube contact. What chemotherapy drugs should be prescribed to the child?
A. Isoniazid + ethambutol + PASK + streptomycin
B. Isonifazid + streptomycin + tibon + ethambutol
C. Rifampicin + PASK + isoniazid + ethambutol D.
Phtivazid + tibon + kanamycin
+E. Isoniazid + rifampicin + pyrazinamide + ethambutol

4. Discussion of theoretical issues:

1. What forms of tuberculosis are primary?
2. What are the features of the anamnesis in primary forms of tuberculosis?
3. What are the clinical manifestations of primary forms of tuberculosis?
4. What are the features of the clinical examination of patients with primary forms of tuberculosis? 5. Diagram of the topography of intrathoracic lymph nodes according to V.A. Sukennikov.
6. What changes are detected during the laboratory examination of patients with primary forms of tuberculosis?
7. What are the radiological manifestations of tuberculosis of the intrathoracic lymph nodes and primary tuberculosis complex (stages)?
8. What complications can occur with a complicated course of local primary forms of tuberculosis?
9. What are the main signs of differential diagnosis of tubintoxicitywith helminthiasis, rheumatism, tonsillitis?
10. What are the main signs of differential diagnosis of tuberculosis of intrathoracic lymph nodes with lymphogranulomatosis and nonspecific adenopathies: measles, whooping cough, viral infections.
11. What are the main signs of differential diagnosis of primary forms of tuberculosis with non-specific pneumonia and eosinophilic infiltrate?

5. Topics of reports/abstracts:
- differential diagnosis of primary tuberculosis complex with non-specific pneumonia
- differential diagnosis of tubintoxicity with helminthiasis, rheumatism, tonsillitis
- differential diagnosis of tuberculosis of intrathoracic lymph nodes with lymphogranulomatosis and nonspecific adenopathies: measles, whooping cough, viral infections

6.Summing up

7. List of recommended literature (main, additional, electronic information resources):
Main:
1.Phthysiatry: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others] ; under the editorship V. I. Petrenko. Kyiv: Medicine, 2015. 471 p.
2. Phthisiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. - Kharkiv: KhNMU, 2016. - 176 p

Additional:

1. Prevention of tuberculosis. Study guide for students and interns of VNMZ IV accreditation level and doctors / V. I. Petrenko, M. G. Dolynska, A. V. Aleksandrin, V. V. Petrenko. Kyiv: 2 Print, 2017. 88 p.2.Order on the specialty "Physiology" "On the approval of health care standards for tuberculosis dated February 25, 2020 No. 530 (as amended by the order of the Ministry of Health of Ukraine dated October 6, 2021 No. 2161) HEALTH CARE STANDARDS FOR TUBERCULOSIS.
Electronic information resources:
1.www.dec.gov.ua/mtd/dodatki/2016_729_VGC/2016_729_YKPMD_VGC.doc
2.http://www.ifp.kiev.ua/doc/people/tubzar.htm

Practical lesson 7

Topic:Pulmonary tuberculosis: secondary forms. Clinical classification of

patients. Goal:

Basic concepts: Get acquainted with the pathogenesis of secondary forms of tuberculosis, features of their course at the current stage, forms, features of the X-ray picture of each form, diagnostic methods, causes of complications and their prevention.

Equipment: a laptop with a presentation, a multimedia projector, individual tasks on the topic of a practical lesson, a negatoscope, a set of radiographs with secondary forms of tuberculosis

Plan:

1. Organizational measures(greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

2. Control of the reference level of knowledge(written work, written test, face-to-face survey, etc.) (if necessary):

- Study clinicalsubacute course disseminated, focal, infiltrative pulmonary tuberculosis, caseous tuberculosis pneumonia, fibro-cavernous pulmonary tuberculosis and its features in the conditions of a tuberculosis epidemic.
- The main diagnostic signs necessary to substantiate the diagnosis of focal, infiltrative pulmonary tuberculosis, caseous pneumonia and pulmonary tuberculosis.
- Differential diagnosis of focal tuberculosis with non-specific pneumonia, infiltrative tuberculosis with pleuropneumonia and lung cancer, caseous pneumonia with non-specific pneumonia, lung tuberculosis with peripheral cancer and echinococcal cyst.
- Standard treatment regimens for secondary tuberculosis

3. Formation of professional skills and abilities(mastery of skills, conducting curation, determining the treatment regimen, conducting laboratory research, etc.).

1.In a 25-year-old man, during a preventive FG-examination in the I and II segments of the right lung, focal shadows of low and medium intensity with indistinct contours were detected. There are no complaints. What clinical form can be suspected in this patient?

+A. Ognishchevy

B. Disseminated. S.

Miliarnyi.

D. Infiltrative E.

Tuberculoma.

2.In a 32-year-old patient, after 6 months. during inpatient treatment for infiltrative tuberculosis of the upper lobe of the right lung, a tuberculoma with a diameter of 3 cm was formed. What radical method of treatment can be used in this case?

A. Thoracoplasty.

B. Artificial pneumothorax.
+S. Segmental lung resection D.
Pulmonectomy.
E. Extrapleural pneumolysis.

3.Patient A. is 19 years old and suffers from bronchial asthma. X-ray examination in the 2nd segment of the right lung revealed a shadowing area up to 3 cm in diameter, of low intensity with indistinct contours and illumination in the center. Blood analysis within normal limits. Give the most likely diagnosis.
A. Tuberculoma..
B. Lung cancer.
+S. Infiltrative tuberculosis. D.
Eosinophilic infiltrate.
E. Pneumonia.

4.In a 25-year-old student, foci were found in the right lung during professional examination. Name the predominant localization of focal tuberculosis in lung segments.
+A. 1, 2.
V. 2, 3.
P. 1, 5.
D. 9, 10.
E. 7, 8.

5.The patient after treatment with the domain of infiltrative tuberculosis of the lungs
a medium-sized tuberculoma was formed.
What are the sizes of the average tuberculomas?
A. 1-2 cm.
+V. 2-4 cm.
S. 2-3 cm.
D. 5-6 cm.
E. 4-8 cm.

6.A patient with focal shadows in the lungs was sent to the differential diagnosis department of the hospital. What non-specific lung diseases are most often differentiated from focal pulmonary tuberculosis?
+A. Nonspecific pneumonia. B.
Sarcoidosis.
C. Lung abscess.
D.
Pneumoconiosis.
E. Lung cancer.

7. An X-ray examination of the patient revealed a triangular darkening in the upper part of the right lung, the upper edge was blurred, the lower edge - along the interlobular pleura. What type of infiltrate do these data correspond to?
A. Lobit.
+V. Periscissuritis.
S. Round infiltrate.

D. Cloudy infiltrate.
E. Oval subclavian infiltrate.

8. A 58-year-old patient has symptoms of intoxication and cough for a month. On the x-ray in the upper part of the left lung against the background of inhomogeneous infiltration, two cavity formations were found, surrounded by polymorphic foci. What disease should be thought of first?
A. Tuberculosis of the
lungs. B. Lung cancer
S. Staphylococcal pneumonia.
D. Pneumococcal pneumonia
E. Mycoplasma pneumonia

9. A 65-year-old woman with diabetes fell ill with the flu. On the radiograph of the right lung, a shadow with clarification was found in the upper lobe, which has the form of a triangle with the apex for the root, one side of it is adjacent to the interlobular pleura, therefore it has a clear border, the other is vague. Below the shadow there are several foci with blurred contours. What is the most likely diagnosis for the patient?
A. Atelectasis of the upper lobe
B. Right-sided interlobular pleurisy C.
Central lung cancer
+D. Infiltrative tuberculosis with decay of E.
Influenza pneumonia

10. Patient, 38 years old. A fluoroscopic examination revealed a darkened area in the 2nd segment of the left lung (5 cm in diameter) with a sickle-shaped light near the tracheal bronchus. The shadow is of medium intensity, the contours are even and clear. What clinical form of tuberculosis is most likely detected in the patient?
A. Vognisheva
B. Infiltrative
+S. Tuberculoma
D. Cirrhotic
E. Fibro-cavernous

4. Discussion of theoretical issues:
1 What are the clinical manifestations of subacute disseminated, focal, infiltrative tuberculosis, pulmonary tuberculosis, caseous pneumonia, fibrous-cavernous pulmonary tuberculosis?
2. What are the two clinical and radiological variants of focal tuberculosis? 3.
What are the options for the clinical course of tuberculosis?
4. What are the forms of caseous pneumonia?
5. What changes are detected during the objective examination of patients with the indicated forms of secondary tuberculosis?
6. What laboratory data are used to substantiate the diagnosis of focal, infiltrative tuberculosis, pulmonary tuberculosis, caseous pneumonia?
7. What X-ray changes in the lungs are detected in the specified forms of tuberculosis?

8. What are the main differential and diagnostic signs of focal tuberculosis nonspecific pneumonia?
9. What are the main differential and diagnostic signs of infiltrative tuberculosis pleuropneumonia?
10. What are the main differential diagnostic signs of infiltrative tuberculosis and lung cancer?
11. What are the main differential diagnostic signs of caseous pneumonianonspecific pneumonia?
12. What are the main differential diagnostic signs of tuberculosis and peripheral cancer, echinococcal cyst?
13. What residual changes are found after treatment of focal and infiltrative pulmonary tuberculosis?

5. Topics of reports/abstracts:
- carry out differential diagnosis of tuberculosis and peripheral cancer, echinococcal cyst
- carry out differential diagnosis of caseous pneumonia and non-specific pneumonia
- carry out differential diagnosis of infiltrative tuberculosis and lung cancer

6.Summing up

7. List of recommended literature (main, additional, electronic information resources):
Main:
1. Phthysiatry: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others] ; under the editorship V. I. Petrenko. Kyiv: Medicine, 2015. 471 p.
2. Phthisiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. - Kharkiv: KhNMU, 2016. - 176 p

Additional:
1..V. I. Petrenko, M. G. Dolynska, O. M. Raznatovska. Extrapulmonary and miliary tuberculosis in patients with TB/HIV co-infection / K. 2015: DKS Center. 112 p
2.Order on the specialty "Physiology" "On the approval of health care standards for tuberculosis dated February 25, 2020 No. 530 (as amended by the order of the Ministry of Health of Ukraine dated October 6, 2021 No. 2161) HEALTH CARE STANDARDS FOR TUBERCULOSIS.
Electronic information resource:1.www.dec.gov.ua/mtd/dodatki/2016_729_VGC/2016_729_YKPMD_VGC.doc 2.http://www.ifp.kiev.ua/doc/people/tubzar.htm

Practical lesson 8

Topic: Complications of pulmonary tuberculosis. Tuberculosis of the mucous membrane of the oral cavity and jaw bones. Clinical examination of patients with tuberculosis of the mucous membrane of the oral cavity and jaw bones.

Goal: To determine complications of pulmonary tuberculosis and clinical forms of tuberculosis of the mucous membrane of the oral cavity and jaw bones.

Basic concepts: pathogenesis, pathomorphosis of tuberculosis of the oral cavity and maxillofacial area, features of their course, diagnostic methods, causes of complications and prevention of their occurrence

Equipment:a laptop with a presentation, a multimedia projector, individual tasks on the topic of a practical lesson, a negatoscope, a set of radiographs

Plan:

1. Organizational measures(greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

2. Control of the reference level of knowledge(written work, written test, face-to-face survey, etc.) (if necessary):

- Etiology, pathogenesis, clinical picture, features and course consequencestuberculosis of the oral cavity and maxillofacial region.
- Changes in blood and urine in minor forms of tuberculosis.
- X-ray signs of tuberculosis of the jaw
- Pathogenesis and causes of pulmonary bleeding, spontaneous pneumothorax, development of chronic pulmonary heart disease.
- Clinical manifestations of these complications of pulmonary tuberculosis.
- The main differential diagnostic signs of pulmonary bleeding and bleeding from the stomach, esophagus, and upper respiratory tract
- Basic X-ray signs in the diagnosis of atelectasis and pneumothorax.
- How to provide immediate assistance for complications of tuberculosis: pulmonary bleeding, spontaneous pneumothorax

3. Formation of professional skills and abilities(mastery of skills, conducting curation, determining the treatment regimen, conducting laboratory research, etc.).

1. Small forms of tuberculosis include: A.
Caseous pneumonia
V. Tuberculoma
C. Primary tuberculosis complex D.
Cirrhotic tuberculosis of the lungs
E. Nothing fromlisted (Reg. resp. IN).

2. Secondary forms of tuberculosis include: A.
Tuberculosis intoxication

B. Infiltrative
S. Primary tuberculosis complex
D. Tuberculosis of intrathoracic lymph nodes E.
Nothingfrom the above (Reg. resp. IN).

3.Tuberculosis of the oral cavity includes:
A. Scrofuloderma
B. Miliary-ulcerative tuberculosis C.
Tuberculous lupus
D. Primary tuberculosis complex of the oral cavity E.
Everythingthe above (Reg. resp. IS)

4.How many stages of tuberculous lupus are distinguished:
A.4
B.2
P.5
D.3
E.6 (Reg. resp. AND)

Situational tasks

Task 1. You were invited to the house of a patient with destructive pulmonary tuberculosis due to pulmonary bleeding (more than 500 ml of blood was released).
a) what immediate help will you provide him, if you do not have any medicines? b) what is the most certain mechanism of such bleeding?
c) your further tactics.
Answer standard:
a) put a tourniquet on the limbs.
b) rupture of blood vessels.
c) to cause immediate
ambulance for further treatment and delivery to a hospital

Task 2. You were invited to see a patient who complains of pain in the left side associated with the act of breathing, which appeared suddenly. Percussion over the left lung – a tympanic tone of the lung sound, auscultation – sharply weakened breathing.
a) name the disease in which similar complaints can be observed.
b) name the signs on the basis of which spontaneous pneumothorax can be suspected here.
c) mark the plan for further examination of the patient to clarify the diagnosis and determine the type of SP
Answer standard:
a) pleurisy, intercostal neuralgia, spontaneous pneumothorax. b)
tympanitis on percussion, sharply weakened breathing.
c) X-ray of OGK.

Problem 3. A patient with fibrous-cavernous tuberculosis of the lungs, MBT(+), was brought to the hospital with complaints of shortness of breath at rest, edema. Objectively: cyanosis, edema on the lower extremities, the liver is 4 cm lower than the costal arch. Above the lungs on both sides

medium bubbling moist rales. Pulse - 100 beats/min., blood pressure - 115/80 mm Hg, the borders of the heart are enlarged. What complication of tuberculosis do you suspect?
Answer: chronic pulmonary heart.

4. Discussion of theoretical issues:

1. Pathogenesis and causes of pulmonary bleeding, spontaneous pneumothorax, development of chronic pulmonary heart disease.
2. Clinical manifestations of these complications of pulmonary tuberculosis.
3. The main differential diagnostic signs of pulmonary bleeding and bleeding from the stomach, esophagus, and upper respiratory tract.
4. Basic X-ray signs in the diagnosis of spontaneous pneumothorax.
5. How to provide immediate help for spontaneous pulmonary hemorrhage pneumothorax
6. Pathogenesis,pathology of tuberculosis oral cavity and maxillofacial area.
7. Clinical forms of tuberculosis of the oral cavity and maxillofacial region.
8. 0ability of epidanamnesis, clinic, objective examination for tuberculosis of the oral cavity and maxillofacial region.
9. X-ray tuberculosis of the jaw.
10. The course of tuberculosis of the oral cavity and maxillofacial region. 11. Complications of tuberculosis of the oral cavity and maxillofacial region.

5. Topics of reports/abstracts:

- modern laboratory methods of diagnosis of tuberculosis
- modern instrumental methods of diagnosis of tuberculosis
- complications of tuberculosis of the oral cavity and maxillofacial area.

6.Summing up

7. List of recommended literature (main, additional, electronic information resources):

Main:

1.Phthysiatry: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others] ; under the editorship V. I. Petrenko. Kyiv: Medicine, 2015. 471 p.
2. Phthisiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. - Kharkiv: KhNMU, 2016. - 176 p

Additional:

1. Prevention of tuberculosis. Study guide for students and interns of VNMZ IV accreditation level and doctors / V. I. Petrenko, M. G. Dolynska, A. V. Aleksandrin, V. V. Petrenko. Kyiv: 2 Print, 2017. 88 p.2.Order on the specialty "Physiology" "On the approval of health care standards for tuberculosis dated February 25, 2020 No. 530 (as amended by the order of the Ministry of Health of Ukraine dated October 6, 2021 No. 2161) HEALTH CARE STANDARDS FOR TUBERCULOSIS.

Electronic information resources:

1.www.dec.gov.ua/mtd/dodatki/2016_729_VGC/2016_729_YKPMD_VGC.doc
2.http://www.ifp.kiev.ua/doc/people/tubzar.htm

Lecture classes

Lecture No. 1

Topic: Definition of tuberculosis as a disease. Epidemiologytuberculosis The causative agent of tuberculosis, its properties. Ways of tuberculosis infection.

Actuality of theme.

The beginning of the new millennium is accompanied by a threatening situation with tuberculosis, which has always been an indicator of social well-being in society. In the last 20 years, there has been no significant decrease in the incidence of tuberculosis in the world. Thus, every year 8-9 million people get sick with tuberculosis and about 1 million die from it. The total number of tuberculosis patients in the world today reaches 60 million, infected about a third of the planet's population. WHO has declared tuberculosis a global threat to humanity. M. tuberculosis kills more people than any other infectious agent. According to WHO estimates, since 1995, an epidemic of tuberculosis has been registered in our country, which is one of the main medical and social problems even today. Four new cases of tuberculosis and one death from this disease are registered in Ukraine every hour. Every year, 37,000 to 39,000 tuberculosis patients are diagnosed and about 11,000 die. The growth of morbidity and mortality is influenced by the spread of poverty, the increase in the number of the penitentiary population, a significant proportion of chemoresistant tuberculosis, and the spread of HIV infection. The issue of combating tuberculosis has been raised to the level of priority national tasks. The country has a full set of measures capable of ensuring that the tuberculosis situation in the country is kept under control.

Purpose: To acquaint applicants with the main stages of the development of the doctrine of tuberculosis, to form in them an idea of epidemiology, etiopathogenesis, pathomorphology, features of the causative agent of tuberculosis, which can cause a wide variety of forms and clinical manifestations of a severe pathological process.

Basic concepts:tuberculosis, phthisiology, epidemiology, etiology and pathogenesis of tuberculosis, immunity in tuberculosis.

Plan and organizational structure of the lecture.

No	The main stages of the lecture and their content	Objectives i nlevels of abstractio n eat	Type of lecture, methods andmeans activation miners, equipment	Distribu tion of time
1.	2.	3.	4.	5.
1. 2.	**Preparatory stage** Setting educational goals Software positivemot ivation **The main stage**		Type lectures– thematiclecture. Lecture equipment:	2% 3%

3.	Presentation lecturematerial Plan: 1. Introduction, rationale andActuality of theme. 2. The history of the development of phthisiology. 3. Epidemiology of tuberculosis. 4. The causative agent of tuberculosis, typesKoch bacteria, properties, color, variability,external resistance environment 4. Ways of penetration of the causative agent of tuberculosis into the body. Changesin penetration. Lubeck tragedy. 5. Classificationtuberculosis 6. Demonstration of patients. 7. Socio-class nature of tuberculosis. Tuberculosis in Ukraine.	 II III III IV	negatoscope, microscope. Sosobita methodsactivation of students: Educational tasks Questions Problem situations Means of visibility: tables, sputum preparations from MBT, X-rays of patients who were demonstrated at the lecture	88%
4.	**The final stage.** Summary of the lecture, general	III		3%
5.	conclusions. The lecturer's answers to possible	II		2%
6.	questions. Tasks for self-training acquirers	III	List literature,questions, tasks.	2%

Content of the lecture material.

Tuberculosis is a chronic infectious disease caused by mycobacteria.

Today, it is safe to say that tuberculosis has existed since the beginning of human history and in modern conditions, as before, is a very relevant social problem.

Epidemiology. By the beginning of the 60s, the concept of tuberculosis as a disappearing disease had developed. However, this prediction did not come true. Over the past 20 years, there has been no significant decrease in morbidity in the world. As before, every year 8-9 million people fall ill with tuberculosis and about 2 million die from it. And these figures are far from complete, because reliable records of patients are not established everywhere.

Medical advances in industrialized countries with high national income and strong social programs over the past 20 years have reduced tuberculosis from a widespread disease to a relatively minor public health problem. However, the main reservoir of infection remained in underdeveloped countries with high birth rates or countries with limited economic opportunities. This leads to the fact that the total number of tuberculosis patients in the world continues

increase. According to WHO experts, if the situation does not change, then between 2000 and 2020, almost one billion people will be infected, 200 million will get sick and 35 million will die from tuberculosis.

According to WHO criteria, Europe is divided into three categories according to the level of tuberculosis incidence:

- low-prevalence countries, where the incidence rate is lower than 10 cases per 100,000 population, which include Germany (8.0), Finland (9.0), Italy (7.0), Switzerland (7.0), Monaco 0.8), Israel (9.0);

- countries with an average level of distribution. These are Austria (14.0), Belgium (14.0), Hungary (29.0), Turkey (26.0), Spain (27.0), Czech Republic (12.0), France (12.0), Greece (20.0), Slovakia (24.0). Their incidence rate ranges from 10 to 30 cases per 100,000 population.

- countries with a high level of prevalence, where the incidence rate is higher than 30 cases per 100,000 population. These countries include 15 former USSR countries (Belarus 53.0; Estonia 50.0; Georgia 83.0; Kazakhstan 145.0; Kyrgyzstan 124.0; Latvia 75.0; Lithuania 70.0; Republic of Moldova – 139.0 ; Russian Federation 112.0 Ukraine 92.0) and Romania (149.0), Bulgaria (43.0), Poland (31.0). Digital data are given for 2003.

Phthisiologists are well aware that the results of comparing epidemiological indicators should be treated with caution, because there are different principles of tuberculosis registration. In many countries, only patients excreting mycobacteria are taken into account. In Russia, all cases of active tuberculosis are traditionally taken into account.

According to an authoritative guide (Harrison's Principles of Internal Medicine. New York: McGraw-Hill, 1998), in the United States tuberculosis is becoming a disease of the elderly, and it is often found in nursing homes. Although this disease occurs at any age, most cases of the disease in older people are an echo of the past. Today's elderly people were children at a time when infection with mycobacterium tuberculosis was much more common. Among those infected in childhood, many developed tuberculosis at a young age. Many of them, especially men, reactivate the process in old age. At the same time, the share of elderly people who have not been infected in previous years and who have contracted tuberculosis for the first time in a nursing home, where the disease has become an intra-hospital infection, is increasing.

The Merck Manual (1997) interprets this problem similarly, where it is noted that out of almost 23,000 cases of tuberculosis in the USA in 1995. about 28% fell on people older than 65 years. This aging of tuberculosis is attributed to three main reasons.

1. Older people were infected during the period of high prevalence of tuberculosis.

2. With age, the functions of the immune system decrease, the body loses its ability to suppress mycobacteria that were in an inactive state.

3. Older people often come into contact (especially in nursing homes) with other older people who are more likely to have TB than the general population.

In most industrialized countries, the prevalence of tuberculosis is decreasing, but in countries with limited economic opportunities, the situation is different. In some of them, the incidence reaches more than 700 per 100,000 population (722 in Namibia, 2003). In developing countries, tuberculosis remains the third most frequent cause of morbidity and mortality among women of reproductive age (from 15 to 44 years). Substantial

share is occupied by 45 African countries, where the incidence reaches (per 100,000 population in 2003): Botswana – 633.0; Ethiopia - 356.0; Kenya – 610.0; Namibia 722.0; South Africa – 536.0; Uganda – 411.0; Tanzania -371.0; Zimbabwe - 659.0. with rather passive methods of detecting this disease (that is, the real value is even higher). In most regions of Africa with an HIV epidemic, the incidence of tuberculosis has tripled. In Latin America, the incidence of tuberculosis is: Bolivia - 225.0; Brazil – 62.0; Haiti 323.0; Honduras -81.0; Peru – 188.0; Mexico -33.0 (per 100 thousand population in 2003). . The South Asian region gives different figures — from 142.0 in Thailand to 285.0 in
100 thousand in Indonesia. In India, the incidence in 2003 reached 168.0 per 100,000 population. In 35 countries of the Western Pacific region, pronounced contrasts were found. Thus, in Australia, the incidence is 6.0, in the Philippines - 296.0, and in Cambodia - 508.0 per 100,000 population.

In recent years, the incidence of tuberculosis and mycobacteriosis has been increasing in the USA, in a number of European and African countries. Most scientists associate this with the growing AIDS epidemic, immunodeficiencies of other origins and social problems: alcoholism, drug addiction, migration of large groups of people. The migration factor was once not given much importance, but it turned out that in the conditions of unevenly affected countries on tuberculosis, this factor can have an effect.

WHO has declared tuberculosis a global threat to humanity. M. tuberculosis kills more people than any other infectious agent. In developing countries, TB-related deaths account for about 25% of all preventable deaths.

Since the beginning of the 90s of the 20th century, a gradual worsening of the epidemiological situation with tuberculosis has been noted in the countries of Eastern Europe, the CIS, as well as in Ukraine. The tuberculosis epidemic in Ukraine, which has been officially registered since 1995, is becoming an unmanageable and threatening medical and social problem. Today in Ukraine, the total number of patients under the supervision of anti-tuberculosis institutions is 597,000, including the number of patients with active forms of tuberculosis reaching 107,000. The highest incidence rates for all forms of tuberculosis were observed in the southeastern regions of Ukraine (data for 2005): in Kherson region – 174.0 per 100 thousand population; Luhansk - 114, 3; Mykolayivska
111.1; Kirovohradska – 109.9; Donetsk -103.4; Odesa – 95.3; Zaporozhye - 92.5;
Kharkivska – 90.5.

The incidence of tuberculosis among children under the age of 14 from 1992 to 2005 increased by 1.62 times, or by 61.82% (from 5.5 per 100,000 children in 1992 to 8.9 in 2005). The highest incidence of tuberculosis among children under the age of 14 in 2005 was observed in the following regions: Autonomous Republic of Crimea - 18.0; Kirovohradska - 14.0; Luhansk - 13.0; Donetsk - 12.2; Zhytomyrska - 11.6;
Zaporozhye - 11.3; Sevastopol - 10.7; Rivne 10.5; Ternopil - 10.5.

Mortality from tuberculosis, as well as morbidity, increased 2.46 times or 146.32% in Ukraine between 1992 and 2005 (from 9.5 per 100,000 population in 1992 to 23.4 per 100,000 . in 2005). Annual losses from tuberculosis in Ukraine in 2000 amounted to about UAH 1.5 billion. Tuberculosis takes about 11,000 lives in Ukraine every year.

The increase in the level of morbidity and mortality is influenced by the spread of poverty, an increase in the number of the penitentiary population (where the incidence is 2,796 per 100,000 of this contingent), a significant specific weight of chemoresistant tuberculosis (in Ukraine

the frequency of primary chemoresistance ranges from 7 to 20% in different regions, secondary - 75%, MLS approximately - 9% in newly diagnosed patients), spread of HIV infection. The issue of combating tuberculosis has been raised to the level of priority national tasks. The country has developed a new State target program for tuberculosis control for 2007-2011, which provides for a full set of measures capable of ensuring that the tuberculosis situation in the country is kept under control. In order to provide citizens of Ukraine with high-quality medical care when suffering from this disease, the industry standard "Protocol for the management of patients: "Tuberculosis" was created, approved by the order of the Ministry of Health of Ukraine No. 384 dated 06.09.06.

Tuberculosis should be known by doctors of all fields due to the fact that this disease affects the entire human body and can be localized in all organs and systems of the macroorganism. If a person begins to cough, has a temperature or other symptoms, he does not go to the tube dispensary, but first of all he turns to his district therapist, who depends on the accuracy of the diagnosis, the timeliness of certain examination methods, so as not to miss tuberculosis. The same applies to surgeons, gynecologists, laryngologists, ophthalmologists, dermatologists, pediatricians, infectious disease specialists, and others.

History. Ancient doctors knew tuberculosis very well. Doctors of ancient Greece, led by Hippocrates (4th - 5th centuries BC), skillfully described the picture of pulmonary tuberculosis. Aristotle claimed that tuberculosis (so called tuberculosis) is contagious. For several centuries, the teachings of the Roman physician Galen (131 – 201 BC) were infallible and dominated in medicine. The name of the outstanding scientist Avicenna (980 - 1037) is also known to the whole world. The famous Italian doctor Girolamo Fracastoro (11th century) wrote that dry mouth spreads through the air and by contact. Actual progress in the study of tuberculosis is associated with the name of the French doctor Sylvia (1614-1672), as well as the famous René Théophile Laennec (1781-1826). After Laennec came the era of searching for the causes of tubercular process. Some claimed that tuberculosis develops as a result of a metabolic disorder, others claimed that tuberculosis is a purulent process in the lungs, and others claimed that tuberculosis is an infectious disease.

The honor of finally elucidating the etiology of tuberculosis as an infectious disease fell to the fate of Robert Koch, who established that the causative agent of tuberculosis is the bacteria named Koch bacteria in honor of their discoverer. Robert Koch in 1882 provided comprehensive evidence in favor of the fact that "without the tubercle bacterium there is no tuberculosis."

Koch's triad. Robert Koch isolated a pure culture of MBT from the organs of persons who died of tuberculosis. With this culture, he infected animals that had a tubercular process. He isolated a pure culture of bacteria from the organs of killed animals and proved the identity of this culture and the original one. In this way, it was finally established that tuberculosis is an infectious disease, that all forms of tuberculosis are caused by a single pathogen.

At the meeting of the Physiological Society in Berlin on March 24, 1882, Koch gave a report "Etiology of tuberculosis", in which he presented convincing data on his discovery of the causative agent of tuberculosis. For this discovery, Koch was recognized as worthy of the Nobel Prize in 1911. Among the reasons contributing to the emergence and development of tuberculosis, Koch emphasized the role of social factors. "Readiness for illness," he wrote, "

it is especially large in weakened organisms that are in poor conditions. As long as there are slums on earth where the sun's rays do not penetrate, drought will continue to exist."

In 1982, by decision of the World Health Organization, the 100th anniversary of Koch's discovery of the causative agent of tuberculosis was widely celebrated.

The causative agent of tuberculosisbelongs to the genus Mycobacterium of the family Mycobacteriaceae, order Actinomycetalis. It is known that there are several types of mycobacteria that cause tuberculosis in humans and animals: Mycobacterium tuberculosis (human species), Mycobacterium bovis (bovine species), Mycobacterium africanum (intermediate species). At 92
% of cases of tuberculosis in humans is caused by M. tuberculosis, in 5% by M. bovis, in 3% by M. africanum.

It should be noted that not only these mycobacteria cause diseases in humans. Thus, mycobacteria of the MAIS complex (M.avium, M.intracellularae, M. scrofulaceum) cause diseases similar to tuberculosis in humans and animals. These diseases are still diagnosed only in rare cases. The problem of mycobacteriosis (MAIS) became especially relevant after it turned out that this pathology often develops in AIDS patients and in a significant number of cases is the cause of their death.

Tuberculosis mycobacteria are thin or straight slightly curved rods with a length of 1
– 10 (more often 1 – 4) μm, 0.2 – 0.6 μm wide, homogeneous or granular with slightly rounded ends. They are immobile, will not form endospores, conidia and capsules.

Tuberculosis bacilli are acid-alcohol- and alkali-resistant. These qualities are used in painting. They perceive dyeing very difficult, but after being dyed, they do not discolor even under the influence of alcohols and acids. The most common staining method is the Ziel-Nielsen method.

Since the time of Koch, our ideas about both the morphology and the biology and biochemistry of tuberculous mycobacteria have changed significantly. Great merit in the study of these issues belongs to our domestic scientists - I. I. Mechnikov, Petrov, Togunova, and others. The morphological structure of tuberculosis mycobacteria, described by Robert Koch, is now studied and detailed using new methods of cytological research - luminescent phase-contrast electron microscopy.

The morphology and size of bacterial cells vary significantly, which depends on the age of the cells and especially on the conditions of existence and composition of the nutrient medium. With the help of electron microscopy, the main structural elements of tuberculosis mycobacteria were identified: cell wall, cytoplasmic membrane and its derivative - mesosome, cytoplasm, nuclear substance - nucleotide.

The cell wall limits the cell from the outside, providing mechanical and osmotic protection. Microscopically, three layers with a thickness of 10 nm can be distinguished in the cell wall: outer - dense electron-optical, osmiophobic - less dense, inner layer.

Peptidoglycolipids, lipopolysaccharides, and mycolic acid are determined in the cell wall. The surface of the cell wall is covered with densely packed fibrils consisting of lipopolysaccharides. These fibrils also contain mycolic acid. Peptidoglycan molecules have high mechanical strength, which is important for preserving the viability of the cell and its shape. Violation of peptidoglycan synthesis leads to a loss of elasticity and causes the death of MBT. The cell wall contains species-specific antigens. Vaccines made from the cell walls of mycobacterium tuberculosis have different virulence and immunogenicity.

According to modern ideas, the composition of the cytoplasmic membrane, located under the cell wall, includes lipoprotein complexes. Various enzyme systems are connected with it, in particular redox systems. The processes responsible for the specificity of the reactions of the mycobacterial cell to the environment are carried out in the cytoplasmic membrane.

The cytoplasmic membrane of mycobacterium tuberculosis by invagination into the cytoplasm forms an internal cytoplasmic membrane system, or mesosome. Mesosomes are polyfunctional. The localization of many enzyme systems is connected with them, they participate in the synthesis of the cell wall material, they act as an intermediary between the nucleus and the cytoplasm. Weak development or absence of mesosomes was noted in avirulent strains of Mycobacterium tuberculosis.

The cytoplasm of mycobacterium tuberculosis consists of granules and vacuoles of different sizes.

The nuclear substance of mycobacterium tuberculosis determines the specific properties of the cell, the most important of which are protein synthesis and the transmission of hereditary traits to the offspring. It was established that the main method of reproduction of these bacteria is the division of mother cells into two daughter cells.

Numerous morphological variants of mycobacteria are described: giant forms with bulb-shaped thickened branches, filamentous, mycelial and mace-like, diphtheroid and actinomycotic forms. Tuberculosis mycobacteria can be longer or shorter, thicker or thinner than usual, homogeneous or granular.

The phenomenon of variability of mycobacterium tuberculosis was discovered soon after their discovery. Already in 1888, I.I. Mechnikov reported that, in addition to typical Koch rods, polymorphic forms of these microorganisms are found in cultures. The first report on the possibility of the existence of filtering forms in Mycobacterium tuberculosis dates back to 1910. During chemotherapy of experimental destructive tuberculosis, as well as after its termination, very small simplified structure of pathogen forms called ultrafine. Then it was shown that these forms can revert to the classical rod-shaped form through repeated biological passages. One of the types of variability of many bacteria is the formation of L-forms. The essence of L-transformation is that under the influence of adverse factors, the microbial cell loses its cell wall structure partially or completely. In the first case, the microorganism becomes defective in the cell wall, in the second case, it changes into the form of a spheroplast or protoplast, loses the ability to reproduce and dies. The ability to form L-forms has also been proven in mycobacterium tuberculosis. At the same time, it was found that the transformation of mycobacteria into L-forms is enhanced under the influence of anti-tuberculosis drugs. In the sputum of "abacilar" patients with destructive forms of tuberculosis, L-forms of mycobacteria can be found, which are able to stay in the body for a long time and in the future, under appropriate conditions, revert to the rod-shaped version.

Tuberculosis mycobacteria are very resistant to environmental factors. In natural conditions, in the absence of sunlight, their viability can be preserved for several months, with diffused light, pathogens die in 1-1.5 months. In street dust, MBTs are stored for up to 10 days, on the pages of books - up to 3 months. in water - up to 5 months. Mycobacteria die in sunlight, therefore infection

tuberculosis outside the premises during the day is unlikely. Direct sunlight kills M. tuberculosis within 5 minutes. It is constantly used in tropical countries, and in Russia - in the summer to disinfect blankets and other objects. A 1% solution of sodium hypochlorite dissolves sputum and quickly kills mycobacteria in it, while in a 5% solution of phenol, this pathogen remains viable for several hours. At 60°C, mycobacteria survive for 20 minutes, at 70°C for 5 minutes.

Mycobacterium tuberculosis are considered aerobes, although there is information that some of their species can be considered as facultative anaerobes. These mycobacteria multiply very slowly (one cell division occurs in 14-18 hours). Microscopically visible growth of micro colonies that are cultivated on liquid media at a temperature of 37 0 C is detected on 5-7 days, visible growth of colonies on dense media - on 14-20 days.

Tuberculosis mycobacteria can enter the body in different ways: aerogenously, enterally (through the gastrointestinal tract), through damaged skin and mucous membranes, through the placenta during fetal development. However, the main route of infection is aerogenous.

Each patient with active bacillary tuberculosis infects an average of 10-15 people during the illness. Drops of sputum and sprays of saliva scattered around when the patient coughs spread to a distance of up to two meters from the patient and remain in a suspended state for 30-60 minutes, after which they settle on surrounding objects, dry up and again fall into the air in the form of dust. These particles remain suspended for a long time and easily reach the alveoli when inhaled. Settled particles mix with dust and become less dangerous because they settle in the respiratory tract and are evacuated by mucociliary transport. Although tuberculosis is not classified as a highly contagious disease, 25-50% of people become infected with long-term contact with bactericidal agents. This also means that getting infected with tuberculosis does not always mean getting sick. Only 5-15% of infected people get sick, others develop non-sterile immunity, which we will talk about separately. It is known that mycobacteria that get on healthy, intact mucous membranes or skin do not penetrate the tissue. The spread of mycobacteria is also possible during manipulations carried out in clinical and scientific laboratories with affected tissue, punctate, or secretory material obtained during biopsy.

In addition to the aerogenous route of penetration of tuberculosis infection into the human body, the intestinal route is also proven. In case of enteral infection, the absorptive function of the intestines can be of some importance.

In 1994, Dr. Nazarov (Propaedeutic Clinic of ODMU) experimentally proved the possibility of penetration of tuberculosis infection through the intestine. Dr. Nazarov fed guinea pigs porridge, to which he added sputum from a patient with an open form of pulmonary tuberculosis. Pigs died from generalized tuberculosis.

Behring even claimed that infection occurs exclusively in the alimentary way. However, subsequent experimental data did not confirm this.

The intestinal route of infection occurs in cases of using dishes of a tuberculosis patient or in cases of transmission of tuberculosis from animals to humans.

Of the animals, cows are more often sick. In cows, the udder is often affected by the tuberculous process. Inflammatory nodules the size of a large pearl form on the udder, which is why the disease is called "pearlitis". MBT from the udder affected by "pearlitis".

get into milk and if such milk is consumed raw, it can become a source of tuberculosis infection, especially for young children.

Tuberculosis often occurs in poultry, pigs, sometimes in goats, rarely in sheep, cats and dogs. Flies can also be carriers of tuberculosis infection, sitting on tuberculosis sputum and other secretions of patients, and then using their contaminated paws to transfer microbes to products.

Tonsils, the umbilical cord of babies, damaged skin, etc. can also be entrance gates for tuberculosis infection.

Whatever the entrance gate of the causative agent of tuberculosis, in most cases the formation of a primary focus occurs at the point of penetration of the bacilli. This is clearly evidenced by the results of a clinical and sectional study of children infected with tuberculosis bacteria in Lübeck. In 1930, as a result of a laboratory error, 252 babies in Lübeck were given a virulent culture of MBT instead of the BCG vaccine. Soon, 68 children died, and during the pathomorphological examination of the corpses, the primary focus was found in the intestines and mesenteric lymph nodes in 85% of cases, and in only 15% - in the lungs, oral cavity, and pharynx. During the clinical examination of 131 children who fell ill but remained alive and were observed for a long time, the same pattern of foci distribution was revealed: in most children, the primary focus was found in the lymph nodes, and only in 11 children - in the pulmonary and bronchial lymph nodes. 53 babies did not get sick.

In some cases, intrauterine infection of the fetus is also possible, mainly as a result of the fact that MBTs get from the blood of a sick mother. It has been established that in women with severe hematogenously disseminated tuberculosis, the impression of the placenta is not very rare (according to various authors, from 25 to 65% of cases). When the placenta is damaged, mycobacteria can enter the body of the fetus by swallowing amniotic fluid, as well as by the hematogenous route (umbilical vessel). Intrauterine infection can lead to the development of tuberculosis lesions of different severity in the body of the fetus. Of course, such children die of generalized tuberculosis after birth, and at autopsy they find damage to the liver and periportal lymph nodes, sometimes to the lungs. In rare cases, children live up to 4-6 months. Individual cases of survival of such children are described. But, as a rule, children born to tuberculosis mothers are healthy. And if such children are isolated from a sick mother immediately after birth, they will not, as a rule, get tuberculosis in the future. This, in particular, is evidenced by the data of Debre, who observed 1369 such children for 15 years (from 1920 to 1935). It turned out that only 12 children later became ill, and all children had an external source.

Transmission of tuberculosis through germ cells in humans has not been proven.

Pathogenesis. For a person to get tuberculosis, the causative agent of the disease must enter the human body. However, a person gets sick only when his body is somehow weakened and cannot properly resist the infection. An unfavorable external environment, poor housing and communal conditions, insufficient and improper nutrition, infectious diseases, bad habits (alcohol abuse, drug addiction, drug addiction, etc.) reduce the body's resistance, which contributes to the increase in morbidity and mortality from tuberculosis.

Local changes at the site of MBT penetration are caused primarily by the reaction of polynuclear cells, which is replaced by a more advanced form of protective reaction

with the participation of macrophages, which carry out phagocytosis and destruction of mycobacteria. The result of the interaction between macrophages and mycobacteria is determined by the state of immunity, the level of PCST that develops in the process of tuberculosis infection, as well as a number of other factors, including those that determine the ability of macrophages to digest.

Phagocytosis consists of three phases: the collision phase, when macrophages fix mycobacteria with the help of receptors on the cell membrane; phases of penetration of mycobacteria into the macrophage by invagination of the macrophage wall and "wrapping" of the mycobacterium; the digestion phase, when macrophage lysosomes fuse with phagosomes containing mycobacteria. Enzymes released from phagolysosomes destroy mycobacteria. Peroxide oxidation mechanisms also play an important role in the process of phagocytosis.

Tuberculosis mycobacteria, like some other microorganisms, entering macrophages, can persist and even continue to multiply. When the digestion process of mycobacteria is blocked, macrophages are destroyed and mycobacteria are released from them.

Macrophages that have phagocytosed mycobacteria and digest them release into the extracellular space fragments of destroyed MBT, proteolytic enzymes, mediators (including interleukin-1) that activate T-lymphocytes, in particular T-helpers. Activated T-helpers secrete mediators - lymphokines (including interleukin-2), under the influence of which new macrophages migrate to the location of mycobacteria. At the same time, the synthesis of the migration inhibition factor is suppressed, the enzymatic activity of macrophages under the influence of the macrophage activation factor increases.

With the intensive reproduction of mycobacteria in the human body due to inefficient phagocytosis, a large number of toxic substances are released, a pronounced PCST is induced, which contributes to the appearance of the exudative component of inflammation with the development of caseous necrosis and its thinning. During this period, the number of T-suppressors increases, the number of T-helpers decreases, which leads to the suppression of PCST. This determines the progression of the tubercular process.

With a relatively small bacterial population under the conditions of PCST and effective phagocytosis, the morphological substrate of tuberculosis is formed - tuberculous granulomas.

Pathomorphology. Tuberculosis is classified as a granulomatous process. Chronic granulomatous inflammation is evaluated as a long-term reaction to a pathogenic stimulus, which is gradually destroyed by the cells of the macrophage-phagocytic system.

Tuberculous granuloma is attributed to infectious etiology, and from pathogenesis to infectious immunopathological inflammation.

The morphology of tuberculous inflammation depends on the reactivity of the organism and the virulence of the pathogen. In a tuberculous focus, the phenomena of exudation, necrosis, or proliferation may prevail, and the focus, accordingly, may be predominantly exudative, necrotic, or productive.

In the area of inflammation, a reaction that does not have signs typical of tuberculosis first develops. In it, the phenomena of alteration and exudation are expressed to varying degrees. Disturbances in the microcirculatory channel come first. They touch the thin structure of the alveolar wall. Neutrophils and macrophages migrate to the focus. Cellular immune responses include the transformation of macrophages into epithelioid cells. As a result of their fusion, giant Pirogov-Langhans cells are formed. On

lymphocytes and fibroblasts are located on the periphery of the granuloma. A kind of homogeneous caseous (curd) necrosis is formed in the center.

There is often a perifocal zone of nonspecific inflammatory reaction around the focus of inflammation. As the process progresses, there is an increase in caseous necrosis, increased infiltration of granulation tissue by mononuclear and lymphoid cells, as well as neutrophils, and an expansion of the perifocal inflammation zone. The specific process spreads through contact and lymphatic ways.

During the healing of a tubercular focus, the masses of caseous necrosis are condensed, in the latter, the deposition of small grains of calcium salts is noted. In the granulation tissue, the number of fibroblasts and collagen fibrils increases, which combine into collagen fibers that form a connective tissue capsule around the tubercular focus. In the following, specific granulation tissue is increasingly replaced by fibrous tissue. The number of cellular elements between collagen fibers decreases, sometimes collagen fibers undergo hyalinosis. In such foci and post-tuberculosis foci, altered forms of MBT, in particular L-forms, were detected.

In addition to granulomatous inflammation, paraspecific reactions in various organs and tissues often occur in tuberculosis: the nervous and cardiovascular systems, hematopoietic organs, joints, serous membranes, etc. In the cardiovascular system and parenchymal organs, these reactions are manifested in the form of focal or diffuse histiocytic and lymphocytic infiltration, in lymph nodes - proliferation of reticular and endothelial cells, in the lungs - the formation of lymphoid nodules. O.I.Strukov (1959) believes that these reactions have a toxic-allergic nature.

The use of the most effective chemotherapy drugs leads to a complete cure from tuberculosis. The crucial importance belongs to the macroorganism, the state of its protective mechanisms, the ability to resist the action of an antigenic stimulus, as well as the development of full-fledged reparative processes.

In the last decade, data appeared on the role of specific genetic systems in susceptibility to tuberculosis. At the same time, naturally, first of all, attention was paid to the main human histocompatibility complex - the HLA system, in which (in its DR locus) the genes of the immune response are localized. In all examined populations (among the population of the CIS), the disease of tuberculosis is associated with the same antigen of the HLA DR-locus system - DR2.

In addition, it has been shown that the HLA- (primarily DR)- phenotype differs in patients with various forms of tuberculosis (limited, with a favorable course, on the one hand, and widespread, chronic, on the other).

The number of studies devoted to the study of the relationship between genetic markers in tuberculosis and immunological parameters is still small.

Dependence of the frequency of tuberculosis on the gender of the patient. The results of a study conducted in France in 1998 deserve attention. In general, the prevalence of M. tuberculosis lesions among boys and girls is the same until the puberty period, then there is a preference for males. In the industrialized countries of the middle of the century (1930-1950), tuberculosis was more common among women aged 15-34 than among men. Currently, in these countries, against the background of a decrease in the incidence of tuberculosis, the frequency of the disease among men older than 15 years has become higher than among women. In most developing countries, the current incidence of tuberculosis is similar

that which was in the developed countries in 1930-50, while the age over 15 years also began to be dominated by men.

In recent decades, a number of new approaches to studying the mechanisms of anti-tuberculosis immunity have emerged. This is hybridoma technology, genetic engineering and T-cell cloning. Thus, with the help of hybridoma technology, a large set of monoclonal antibodies to various antigens of mycobacteria was obtained. These antibodies are being used with more or less success to solve the following problems.

1. Evaluation of the influence of in vivo and in vitro antibodies to various components of mycobacteria on the course of tuberculosis infection. Such studies have not yet produced real results.
2. Detection of mycobacteria (for example, in sputum) and their species identification.
3. Detection of mycobacterial antigens (for example, in cerebrospinal fluid or blood serum as part of immune complexes).

T-cell cloning (production of "descendants" of one T-lymphocyte) is used to study: 1) the spectrum of T-cells that react to various antigenic determinants in tuberculosis and BCG vaccination (such work is just beginning); 2) the role of T-cell subpopulations and clones responding to certain determinants in protective immunity and immunosuppression; 3) use of T-clones to search for protective antigens for the purpose of designing a future anti-tuberculosis vaccine.

Brief information about the department of phthisiology of ONMedU

In 1921, the first tube hospital named after R. Koch. In 1922, the Tuberculosis Institute was organized on its basis, and the Department of Tuberculosis was established on its basis. The organizer of all the above-mentioned institutions was Associate Professor D.L. Meyerson. He is the first chief physician of the hospital, director of the institute (from 1922 to 1924) and head of the department (the first in the Union). The primary task of the department was the organization of teaching issues: creation of educational programs, thematic plans, teaching methods of diagnosis and treatment of patients.

Since 1925, the BCG vaccine, sent to the department by Calmet, has been used for the first time in Odesa, and immediately students and doctors are trained in the method of vaccination that was adopted at that time. Much attention was paid to the study of collapsotherapeutic and surgical interventions for pulmonary tuberculosis, the social essence of the disease.

With the introduction of tuberculostatic drugs into practice, the department published the first candidate's thesis of G.D. Popov in Odesa on the complex treatment of patients with pulmonary tuberculosis with the use of Musculen (1955).

From the moment the department was created until 1955 (except the war years), Prof. D. L. Myerson has been the head of the department for 28 years. After him, his student M. I. Taranenko headed the department.

Since 1956, the department's scientific research has been aimed at improving the methods of diagnosing tuberculosis, finding methods to increase the effectiveness of treatment of patients, and studying various methods of tissue therapy. Many years of clinical and experimental research on antibacterial therapy, taking into account long-term results, are summarized in the doctoral dissertation of M. I. Taranenko and the candidate theses of H. S. Afanasyeva, O. N. Nersesyan, V. D. Smokvin, O. I. Kudrynska, M. I. Stepula.

Together with other departments, work was carried out on isotopic diagnosis of changes in the kidneys in case of pulmonary tuberculosis; during pregnancy, childbirth and the postpartum period in patients with pulmonary tuberculosis; on the use of tuberculin-active peptides in the complex therapy of patients with pulmonary tuberculosis.

The staff of the department studied the effectiveness of anti-tuberculosis drugs, various aspects of the action of tissue drugs. At the suggestion of Prof. Taranenko used combined tissue therapy for the first time, including for the elderly.

The scientific research work of the department constantly enriched practical health care: the immunological effect of tissue preparations in pulmonary tuberculosis was established for the first time in the candidate's thesis of O. V. Bogatyreva; the condition of the lymphatic system in tuberculosis and in complex treatment was studied in the doctoral dissertation of associate professor O. N. Nersesyan; studied the state of the insular apparatus in patients with tuberculosis in combination with diabetes and developed a rational technique for the complex treatment of both diseases for the first time, G.D. Masterov.

During the period of leadership of the department by D. L. Meyerson, M. I. Taranenko, O. N. Nersesyan. 30 dissertations were prepared at the department. Given the prospects for the development of phthisiology and pulmonology in terms of their integration, in 1995 the department was renamed the department of phthisiopulmonology.

For 14 years (1999 - 2013), the department was headed by an honored worker of science and technology, doctor of medical sciences, professor, member of the European Respiratorysociety.O. K. Asmolov. During the period of his leadership, the improvement of educational and methodical, scientific and medical work continued. Under his supervision, 3 PhD theses were defended: Oleksandr Kostiantynovych Asmolov is the author of many textbooks on tuberculosis, monographs and articles. Professor Asmolov O.K. resumed the activity of the Odesa Regional Scientific and Practical Association of Phthisiologists and Pulmonologists. Under the leadership of Asmolov O.K. the following research works were carried out at the department: the functional features of the mucous membrane of the bronchi in patients with COPD were studied in the candidate's thesis of Shpota O.E., the effectiveness of lymphotropic therapy in the complex treatment of patients with destructive pulmonary tuberculosis in the candidate's thesis of Polyakova S.O. Since December 2013, the department has been headed by Professor, Doctor of Medicine. ON. Matsehor Today, the department's research work continues to enrich practical health care.

Materials for activating students during lectures: Questions:

Question:

- What is tuberculosis as a disease? Give a definition.
- What is the social essence of tuberculosis?
- The role of R. Koch in phthisiology. List his main scientific discoveries.
- Describe the causative agent of tuberculosis.
- Epidemiology of tuberculosis.
- Pathogenesis of tuberculosis.

General material and methodical provision of the lecture.

→ Educational premises - lecture hall of the department.

→ Equipment – negatoscope, microscope.

→ Illustrative materials - tables, diagrams, sputum preparations containing MBT, radiographs of patients and their medical histories.

Questions for self-control:

1. What is tuberculosis as a disease? Give a definition.
2. What are the negative trends in the epidemiological situation of tuberculosis in Ukraine?
3. What is the merit of R. Koch in studying the epidemiology of tuberculosis as an infectious disease?
4. List the types of MBT that cause diseases in humans and animals.
5. What are the main properties of MBT?
6. What are the main ways of infecting a person with tuberculosis?
7. What morphological changes occur in the focus of tuberculous inflammation?
8. What factors reduce the body's resistance to tube infection?
9. What is the L-transformation of MBT?
10. What are mycobacteria?

references

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3. Global tuberculosis report 2019 (WHO/CDS/TB/2019.15). Geneva, World Health Organization. 2019 URL:https://apps.who.int/iris/bitstream/handle/10665/329368/9789241565714-eng.pdf
4. Order of the Ministry of Health of Ukraine No. 530 dated February 25, 2020 "Health care standards for tuberculosis". URL: https://phc.org.ua/sites/default/files/users/user90/Nakaz_MOZ_vid_25.02.2020_530_Standarty_medopomogy_pry_TB.pdf
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Lecture No. 2

Topic. Diagnosis of tuberculosis. Tuberculosis of the mucous membrane of the oral cavity and maxillofacial localization: pathogenesis, clinic, diagnosis.

Actuality of theme.

The total number of tuberculosis patients in the world today reaches 60 million, and the infected - about a third of the planet's population. According to WHO estimates, 90 million new cases of the disease are expected in the current millennium.

Annually, the number of tuberculosis patients in the world increases by 8-10 million, and 3-4 million of them die from tuberculosis. In Ukraine, the incidence of tuberculosis has increased 2.3 times in adults and 2 times in children in the last 15 years alone, and on January 1, 2004, it was 80.9 and 9.3 per 100,000 adult and child population, respectively. Tuberculosis claims about 10,000 lives in Ukraine every year. Since 1995, according to WHO estimates, a tuberculosis epidemic has been registered in our country. As of January 1, 2005, there were about 5,029 patients with active tuberculosis in the Odesa region, and 2,217 of them had MBT and are the main source of infection for those around them, especially children and adolescents, who are very sensitive to this infection.

The number of children infected with tuberculosis in 2005 (23), in contrast to 2004 (30), in Odesa region increased by 27%, and adolescents by 50.1%. There are cases of death of children and teenagers from tuberculosis. In Ukraine, in 2004, 674 children and 707 teenagers fell ill with newly diagnosed tuberculosis.

All of the above requires qualitative knowledge of tuberculosis diagnosis in children and adults with the aim of early correct diagnosis, timely treatment, prevention of complications that are the cause of death of children, adolescents and adults.

Goal.

To acquaint students with higher education with modern ideas about the clinic, diagnosis and treatment of tuberculosis of the mucous membrane of the oral cavity and maxillofacial area.

Basic concepts:tuberculosis of the mucous membrane of the oral cavity and maxillofacial area, immunity in tuberculosis, diagnosis.

Plan and organizational structure of the lecture.

No	The main stages of the lecture and their content	Objectives i nlevels of abstractio n tions	Type of lecture, methods andmeans activation miners, equipment	Distributi ontime
1.	2.	3.	4.	5.
	Preparatory stage			
1.	Setting educational goals		Type lectures are thematic	2%
2.	Provision of positive		lecture.	3%

	motivation			
3.	**The main stage** Presentation lecturematerial Plan: 1. Introduction, justification and relevance of the topic. 2. Methods diagnosticstuberculosis (general clinical, laboratory, X-ray, tuberculin diagnostics). 3. Pathogenesis, clinical picture,diagnosis tuberculosisoral cavity and maxillofacial mucosalocalization. Features I will run **The final stage.**	 I III III-IV	Lecture equipment: negatoscope, tables,fluoroscope Sosobita methodsactivation of students: Educational tasks Questions Problem situations Means of visibility: tables, slides,X-rays Histories of diseases, analysisclinical situations ,dummies	88%
4.	Summary of the lecture, general conclusions.			3%
5.	The lecturer's answers to possible questions.			2%
6.	Tasks for self-training acquirers		List literature,questions, tasks.	2%

Content of the lecture material.

A significant number of methods were proposed for the diagnosis of tuberculosis during the 19th and 20th centuries. Pathological anatomy, microbiology, immunology, genetics, molecular biology, physics and mathematics added their achievements to the rich clinical experience. Today, the doctor uses an extremely wide range of methods for diagnosing tuberculosis, which differ significantly in their sensitivity and specificity.

All diagnostic methods can be divided into two main groups. The first, common to all diseases, includes methods that are based on the determination of changes in the body characteristic of a given disease. In the case of tuberculosis, the direct methods of this group are morphological (histological diagnosis of changes in tissues) and radiation (radiological diagnosis of changes in organs) methods. Indirect classic methods are a direct examination of the patient (anamnesis and physical examination), laboratory studies (clinical, biochemical, immunological, and others), methods of functional diagnostics.

The second group of diagnostic methods, which are used only for infectious diseases, consists of methods aimed at finding and identifying the causative agent of the disease. These can be either direct methods: material microscopy, selection of a culture of microorganisms, molecular diagnostics, or indirect methods that allow detecting the presence of the pathogen in

the body: tuberculin diagnostics, detection of M. tuberculosis antigens, specific anti-tuberculosis antibodies.

Clinical methods. The first were methods based on obtaining data on disease manifestations. The art of collecting anamnesis and direct examination of the patient, brought to perfection by the work of many generations of doctors, made it possible to form the very concept of phthisis as a long-term debilitating disease with predominant damage to the respiratory organs.

The anamnesis of the disease begins with the clarification of the patient's complaints. The variety of manifestations of tuberculosis depends on the phase and spread of the process, as well as on the localization of specific changes in the lungs. The onset of the disease in tuberculosis is more often gradual and rarely acute.

The earliest and most frequent complaints of tuberculosis patients are weakness, rapid fatigue and reduced work capacity. In addition, the patient often notices the presence of increased body temperature, night sweats, sleep disturbances and deterioration of appetite and weight loss. The cause of these phenomena is tuberculosis intoxication, which occurs as a result of the vital activity of mycobacterium tuberculosis, as well as the products of protein breakdown in the affected organ.

An increase in body temperature is especially diverse. In most patients with pulmonary tuberculosis, in the initial period of the disease, it is normal, or subfebrile for several weeks. In the case of progression of the process or its acute onset, the body temperature rises to 380 - 390 C. Only in cases of miliary tuberculosis, acute pleurisy, the body temperature sometimes reaches 400 C. The temperature curve has an irregular character: mostly, the body temperature rises briefly in the evening, and then normalizes. Less often, the patient's elevated temperature can last the whole day and decrease only after sleep. Patients often do not feel elevated body temperature, they continue to work as usual.

Local manifestations of the disease are associated with damage to the respiratory system: cough, shortness of breath, expectoration, chest pain, hemoptysis.

Cough is the most common symptom in patients with pulmonary tuberculosis, from a mild cough at the beginning of the disease to a significant spread of the lesion in the lungs. The patient does not pay attention to coughing or associates it with smoking or a cold. Paroxysmal dry cough can be a manifestation of tuberculosis of the intrathoracic lymph nodes or tuberculous endobronchitis.

With limited processes in the lungs, sputum may not be released or it may be very little. With the appearance of destruction, the amount of sputum increases and in chronic forms can reach 100-200 ml per day. It is mucoid or muco-purulent in nature, almost never has an unpleasant smell.

Hemoptysis and bleeding usually complicate destructive forms of tuberculosis. Their cause may be: increased permeability of blood vessels caused by the toxic effect of microorganisms and tissue decay products; rupture or erosion of blood vessels in the area of lung tissue destruction; high blood pressure in the bronchial arteries; disorders in the blood coagulation system, activation of fibrinolysis. Hemoptysis and bleeding are most often observed with pronounced morphological changes in the lungs, as well as in cases of basal sclerosis of the lungs and bronchiectasis. With hemoptysis and pulmonary bleeding, the blood is bright red, foamy (see "Complications of pulmonary tuberculosis").

Shortness of breath is not characteristic of the initial manifestations of tuberculosis and appears only during physical exertion. It can be observed as an early symptom only with

miliary tuberculosis and tuberculous pleurisy. Shortness of breath is determined by the prevalence of the process and the development of pulmonary heart failure, is a symptom of spontaneous pneumothorax and atelectasis.

Chest pain is caused by the transition of the process to the pleura, intensifies during deep breathing, coughing. The pain has a stabbing character and is usually not intense. Dull or aching pain in the chest occurs in chronic processes and is caused by shrinkage of the lungs and narrowing of the chest. Acute, sudden pain occurs with spontaneous pneumothorax.

In the anamnesis of the disease, first of all, we find out the duration and features of its course. In most cases, tuberculosis begins gradually, that is, with a slow increase in malaise, the appearance of subfebrile body temperature, cough, and weight loss. Tuberculosis can begin imperceptibly for the patient (unaperceptively). Sometimes the onset of the disease can be acute, as a rule, with miliary tuberculosis and caseous pneumonia.

Clinical manifestations of tuberculosis are characterized by extreme polymorphism, the forms of the course and localization options of the process are so diverse that they can resemble other diseases, the so-called "masks" of tuberculosis (influenza, pneumonia, bronchitis, typhoid fever, rheumatism, whooping cough, etc.).

When interviewing the patient, it is necessary to find out the epidemiological anamnesis (contact with a tuberculosis patient, especially family). In addition, information about past illnesses (frequent pneumonia, pleurisy, etc.), accompanying illnesses that increase the risk of endogenous reactivation of tuberculosis (diabetes, gastric and duodenal ulcers, alcoholism, HIV infection, mental illnesses, chronic obstructive pulmonary disease) are also important. recent pregnancy, childbirth. It is important to work in harmful conditions, excessive smoking, unfavorable sanitary and household living conditions.

It is important to find out the date and results of the previous fluorographic examination in adults, and for children - information about BCG vaccination, results of tuberculin diagnostics. The task of clinical examination is to identify not only bright, but also subtle symptoms of the disease. In other words, the search for microsymptomatics is underway. And quite often, this kind of research allows you to identify certain symptoms that can be used to clarify the diagnosis.

An external examination involves the detection of manifestations of tuberculous intoxication. In some patients, there is a shine in the eyes, a blush on the cheeks against the background of pale facial skin. Persistent, red dermographism is noted, red spots (Troussot spots) may appear on the skin of the neck and front of the chest. These manifestations develop as a result of irritation of the sympathetic nervous system.

At the beginning of the disease, the examination of the patient does not reveal any visible deviations from the norm. During the chronic course of tuberculosis, characteristic changes in appearance are formed due to the duration of tuberculosis intoxication, morphological changes in the lungs, the development of complications, the so-called habitus phthisicus (see the topic "Fibrous-cavernous tuberculosis"). Paraspecific manifestations of a toxic-allergic nature (erythema nodosa, keratoconjunctivitis, phlykten) are found in children with tuberculosis.

During the examination, the symmetry and participation of both halves of the chest in breathing, the prominence of the supraclavicular and subclavian fossae are compared. With significant cirrhotic changes, the chest is deformed (its corresponding half narrows), so the affected side lags behind during breathing.

Palpation determines skin turgor and moisture, muscle tone, and the thickness of the subcutaneous fat layer. In children, micropolyadenitis is detected (an increase in peripheral lymph nodes is greater than in 5 groups). Over areas of infiltration or cirrhosis, the voice tremor is increased, and in case of exudative pleurisy, pneumothorax, it is weakened. Palpation of the upper edge of the trapezius muscle causes a feeling of pain (Potenger-Vorobiov symptom). During palpation of the abdomen, the size of the liver and spleen is determined, an increase in mesenteric lymph nodes is possible.

Percussion is performed according to the generally accepted method: first comparative, then topographic. Over a healthy lung, the percussion sound is clear pulmonary, which is caused by its elasticity and airiness.

A box percussion sound is determined over areas of compensatory emphysema (more often in the lower parts of the lungs). A tympanic sound occurs during percussion over large caverns, the diameter of which is more than 4 cm, over a tense spontaneous pneumothorax. If the lung tissue around the cavity is compacted due to the development of fibrosis in it or there are massive infiltrative changes above the cavity, a shortening of the percussion tone can be determined. A shortened and dull percussion sound is determined over the areas of reduced pneumatization of lung tissue with infiltrates, focal-fibrous changes, as well as with atelectasis over an airless lung, in cases of exudative pleurisy. It should be borne in mind that with widespread disseminated forms of the lungs or limited infiltrates, areas of compaction alternate with areas that are well filled with air, so it is difficult to detect changes in the percussion sound.

Topographic percussion allows you to determine the limits of the lungs: the upper or standing height of the apices, their width (the width of the Krenig fields), the size and location of the mediastinum, as well as the localization and size of the pathological process in the lungs.

In most cases, pathological changes in secondary forms of tuberculosis are localized in the upper parts of the lungs. With a long process, the tops shrivel due to their replacement by fibrous tissue, therefore, their standing height above the collarbones may be lower than normal (3-4 cm). At the same time, the width of the Krenig fields, which are determined by percussion of the upper edge of the trapezius muscle, also decreases.

By percussively determining the lower limit of the lungs and exhalation, it is possible to measure the active excursion of the lungs and diaphragm.

Auscultation is performed sequentially over symmetrical areas of the lungs. The patient should breathe calmly and deeply through a half-open mouth and, at the request of the doctor, cough quietly at the end of exhalation. Attention is paid to the type of breathing (vesicular, bronchial, hard) and additional noises (wet or dry wheezing, crepitation). Auscultation should be performed especially carefully in the supraclavicular and subclavian areas, taking into account the frequent localization of the tubercular process in the upper parts of the lungs. Listening to changed breathing and wet wheezing in the so-called "alarm zones" (above the upper corner of the scapula, as well as under the collarbone), as a rule, indicates the presence of a destructive process. In addition to the tops of the lungs, the areas located in the 4th intercostal space in front, in the 2nd, 5th, 6th intercostal spaces of the axillary area, behind near the lower corner of the scapula, and in the paravertebral area at the level of the middle of the scapula are carefully listened to.

Over areas of emphysema, with exudative pleurisy, thickened pleura, and a developed subcutaneous fat layer, weak breathing is heard. Increased breathing is heard in cases of infiltrative process in the lungs. With the development of fibrotic changes in the lungs, breathing becomes difficult. Above the large caverns that have

the fibrous capsule and the connection with the bronchus can be heard for bronchial or amphoric breathing. Wet rales of various caliber are heard over the pathologically changed lung over areas of caseous necrosis and perifocal inflammation. Dry wheezes are more often heard when the bronchi are damaged and in areas of fibrosis. In case of fibrinous pleurisy, during auscultation, the noise of friction of pleural sheets is determined.

In most patients with pulmonary tuberculosis, the borders of the heart are within the normal range, but in acute or chronic forms of tuberculosis, the borders of the heart may increase, during auscultation, the splitting of the second tone, sometimes the first tone, the accent of the second tone over the pulmonary trunk, a faint systolic murmur and tachycardia are heard. that is, signs of hypertension in the small circle of blood circulation and chronic pulmonary heart disease. The pulse is accelerated, labile.

With extrapulmonary forms of tuberculosis, along with the general symptoms caused by tuberculosis intoxication, patients also have local manifestations of the disease on the side of the affected organ.

Laboratory methods.

Identification of the causative agent. Detection of MBT in various pathological material from patients is of crucial importance for the diagnosis of tuberculosis infection. The detection of the causative agent of tuberculosis is the main and indisputable criterion that indicates the specific nature of the disease.

Traditional methods of detecting MBT in pathological material are bacterioscopic, bacteriological and biological methods. In addition to sputum, objects of investigation at the MBT can also be urine, feces, cerebrospinal fluid, exudate from cavities, pus, secretions from wounds, biopsies of various tissues.

The diagnostic significance of laboratory methods is determined by the quality of the biological material delivered for analysis. WHO has adopted uniform rules for taking biological fluids for the study of the causative agent of tuberculosis. The main requirements are three times taking the material from the patient before the start of specific therapy, compliance with the rules of delivery and processing of the material before the study.

One of the main methods of detecting MBT is bacterioscopic. The essence of the method is the ability of mycobacteria, which are stained with fuchsin, to retain the dye after long-term decolorization in hydrochloric acid alcohol. In many countries, it is widely used not only for diagnosis, but also for the detection of tuberculosis patients during mass surveys of the population.

During direct bacterioscopy, the preparation is stained according to the Ziel-Nielsen method. To do this, prepare a thin smear on a glass slide, then dry it at room temperature and fix it over the flame of an alcohol still. A strip of filter paper is placed on the fixed preparation, which is filled with Zil's carbolic fuchsin. The smear is heated over a flame until steam appears (2-3 times). Next, the filter paper is removed, the drug is washed with distilled water, immersed in a solution of hydrochloric acid alcohol or a 5% solution of sulfuric acid for 3 minutes. At the same time, all bacteria and morphological elements of sputum, except mycobacterium tuberculosis, are discolored. After that, the drug is thoroughly washed with water and stained with a 0.5-1% solution of methylene blue for 1-2 minutes. Then the drug is washed with water, dried in air. Stained preparations are microscoped with an immersion system. MBTs are colored red, and the surrounding background and non-acid-fast microorganisms are colored blue.

In order to detect MBT in the preparation by the bacterioscopic method, it is necessary that 1 ml of sputum contains at least 100,000 microbial bodies. With a smaller number of mycobacteria, the test may give a false negative result.

The ability of the bacterioscopic method to detect MBT increases by 14 - 20% when using fluorescent microscopy. For coloring the drug, fluorochromes are used - organic dyes that fluoresce when illuminated with ultraviolet, violet or blue rays. Such dyes are auramine 00, rhodamine C. A sputum smear is stained with a mixture of 0.05 g of auramine and 1000 ml of distilled water, heated slightly, washed with water, decolorized with 3% hydrochloric acid alcohol, washed again and methylene blue is applied for 1-2 minutes. The drug is examined with the help of a fluorescent microscope. MBTs glow golden-yellow on a dark background.

Flotation and sedimentation methods are used to increase the number of MBT in a unit of the studied volume of sputum.

Modern clinics use the flotation method. The method is based on the fact that when two liquids with different relative densities are shaken, the lighter liquid floats to the top together with mycobacterium tuberculosis in suspension.

For research using the flotation method, 10-15 ml of sputum is placed in a flask with a capacity of 200-250 ml, 2-3 ml of 0.5% alkali solution is added and shaken for 10-15 minutes until the sputum becomes homogeneous. To achieve complete homogenization, the sputum flask is heated for 20-30 minutes. in a water bath at a temperature of 560 C. Next, about 100 ml of distilled water and 0.5 ml of xylene or benzene are poured into the flask and shaken again for 10 min. After that, distilled water is added to the neck of the bottle and left to stand at room temperature for about 30 minutes. A creamy foam floats on the surface of the liquid, which is sucked off with a pipette and applied to a glass slide. The layer of foam on the slide is dried and a new layer of foam from the flask is applied. In this way, the foam is layered 5-6 times, after which the smear is fixed and colored according to Ziel-Nielsen.

The bacteriological method of detecting MBT consists in inoculating sputum on nutrient media. Before seeding, sputum is processed to suppress the growth of non-specific microflora. The standard nutrient medium for growing MBT is Levenstein–Jensen solid egg medium. In recent years, egg medium II, proposed by E.R. Finn, has been widely used. There are also semi-liquid and liquid nutrient media. Culture growth takes place within 14-90 days.

20-100 microbial cells in 1 ml of sputum are enough to isolate the MBT culture. In the presence of mycobacteria detected by the culture method, the sensitivity of MBT to chemotherapy must be determined. Popescu's medium, which contains KNO3, is used for rapid establishment of drug resistance. Sensitivity to chemopreparations can be determined both to individual drugs and to their combinations.

Often, MBTs determined by bacterioscopy do not grow on nutrient media due to the loss of the ability to reproduce under the influence of chemotherapy drugs.

The sensitivity of the above-mentioned methods in the diagnosis of extrapulmonary forms of tuberculosis is noticeably reduced. In recent decades, bacteriological methods have been significantly improved in the developed countries of the world. The companies "Organon Teknika" and "Becton Dickinson" (USA) offered automatic analyzers of bacteriological cultures

"MB/Bact", "BACTEC 960", which use liquid selective nutrient media. The method is based on the registration of CO2, which is released by viable mycobacteria. These analyzers allow you to get a positive result of the analysis for pathogenic mycobacteria on the 12th day, and a negative result on the 21st day. However, the high cost of the equipment makes it inaccessible to most medical facilities. In our country, this method was not widely used.

The biological method consists in infection with the sputum of guinea pigs, which have a high sensitivity to MBT. This method is widely used in diagnostics since the discovery of the causative agent of this infection. It has not lost its value even now. Moreover, this method is now successfully used in the laboratories of scientific research institutes to detect not only typical unchanged, but also various biologically modified forms of the pathogen, in particular L-transformed and filter forms. In addition, this method is the main one in determining the species belonging to MBT, their virulence, studying the pathogenicity of atypical cultures.

Before infecting a guinea pig, sputum is treated with sulfuric acid to destroy non-specific microflora and centrifuged. Sediment in an isotonic solution of sodium chloride is injected subcutaneously into the inguinal area, intraperitoneally, or into the testicle. About a month after infection, the lymph nodes in mumps increase and generalized tuberculosis develops.

Among the traditional methods of detecting MBT and diagnosing tuberculosis, the biological method was considered the most sensitive until recently, because tuberculosis in guinea pigs can be caused by the introduction of sputum containing less than 5 microbial bodies in 1 ml. Today, the possibility of loss of MBT virulence has been proven. Such mycobacteria are viable, can grow on nutrient media, but do not cause disease in experimental animals. Therefore, it is necessary to use different methods of microbiological research to detect MBT in pathological material.

Among the new methods of detecting MBT or their antigenic structures in pathological material, new highly sensitive methods - molecular genetic methods and enzyme immunoassay - deserve attention.

Among the molecular genetic methods for the diagnosis of tuberculosis, the method of DNA probing and polymerase chain reaction (PCR) is most often used. These methods are based on the principle of complementarity of nucleotide bases in the construction of a double-helical DNA molecule. When carrying out DNA probing, in the case of the presence of a specific section of DNA of mycobacteria in the examined sample, a hybrid (double-stranded fragment) of the examined DNA and the DNA probe is formed.

Blood test. Usually, pronounced changes are not detected in the blood of tuberculosis patients. Hypochromic anemia is observed only in patients with a widespread process and severe intoxication or with repeated pulmonary bleeding. Changes in the number of leukocytes and the leukocyte formula of the blood occur mainly in acute processes and the breakdown of lung tissue. Can be observed: moderate leukocytosis, shift of the leukocyte formula to the left, lymphopenia, monocytosis. ESR increases during an active tuberculosis process.

Biochemical methods make it possible to assess the state of humoral regulation systems and individual links of metabolic processes, the functional state of endocrine and parenchymal organs. Biochemical studies are carried out in different periods of monitoring patients and have different tasks.

To assess the presence and severity of the inflammatory process, it is advisable to include the determination of the amount of haptoglobin, ceruloplasmin, and C-reactive protein in the minimum set of studies. In order to detect the hidden reactivity of the tubercular process, a tuberculin protein test is performed. In the presence of hidden activity under the influence of tuberculin, the inflammation in the foci "comes to life", which is reflected in the increase in the amount of the alpha2-globulin fraction; the sample is considered positive when alpha2-globulins increase by more than 10% from the initial level. Since in recent years there has been a tendency to increase the frequency of the combination of tuberculosis and diabetes in all patients who come to the hospital, it is necessary to determine the glucose content in the blood.

Urine examination. In patients with pulmonary tuberculosis, urine analysis usually does not provide significant diagnostic information, but sometimes reveals serious complications of the underlying disease (for example, kidney amyloidosis). With tuberculosis of the kidneys, protein, leukocytes, and often erythrocytes, as well as MBT, are detected in the urine.

Examination of urine for MBT is carried out in those cases when at least 15 leukocytes are detected in each field of view during the examination of the sediment. To detect MBT, urine is repeatedly centrifuged, layering each time new portions from the urine sediment on a glass slide. The smear is stained according to the Ziel-Nielsen method. At the same time, decolorization of the drug should be carried out in 3% hydrochloric acid alcohol, since acid-resistant saprophytes (smegma microorganisms) are often found in urine, which are discolored in alcohol. The absence of MBT in purulent urine does not deny the presence of kidney tuberculosis. In such cases, the urine is examined bacteriologically or using molecular genetic methods.

X-ray examination of chest organs(FG, X-ray of the chest organs, X-ray tomography, computer tomography of the affected areas of the lungs). Tuberculosis does not have a specific X-ray picture either by the nature of the X-ray changes or by localization. In recent years, in addition to upper lobe localization, lower lobe localization is common. With a long course of tuberculosis, the X-ray picture can also be supplemented with signs of pneumofibrosis, emphysema, and bronchiectasis. Important for diagnosis is the presence of residual changes of transferred tuberculosis: calcified foci in the lungs or intrathoracic lymph nodes. An analysis of the x-ray fluorography archive can provide great help in the correct treatment of the disease, the search for which should not be neglected. In the presence of focal, infiltrative, destructive changes, rounded formations, regardless of localization, pleural effusion, asymmetric enlargement of the lung roots, tuberculosis should be suspected and the following patient management tactics should be followed. X-ray diagnosis of tuberculosis is the recognition of the disease using X-rays. X-rays (X-rays) are short-wave electromagnetic radiation from 0.0001 to 450 Aº (1 Aº - 10 m). When describing an X-ray picture, you should use algorithms (sequence of signs): localization: by segments, lobes, relative to ribs, clavicle, diaphragm, cortical zone, basal zone, paratracheal, etc.; number of shadows: single, solitary, multiple; shape: oval, round, triangular, shapeless shadows or foci, etc.; size in diameter

- foci, and foci - small, medium, large, or polymorphic (different); contours - blurred, limited, clear, fuzzy, jagged, etc. Qualitative features: intensity: low, medium, high; pattern: mesh, reinforced, deformed.

In tuberculosis, the main radiological syndromes are distinguished: shadowing, illumination, focal shadow (up to 1 cm in diameter), focal dissemination, ring-shaped shadow (cavernous), rounded shadow or spherical shadow (tuberculoma), deformation of the lung root.

Tuberculin diagnosis. At present, there is no doubt that the state of immunological reactivity largely determines the course of many diseases. The term "Immunological reactivity" often has a different meaning, but most authors understand the state of the body's defense forces, the ability of the body to protect itself from infectious and non-infectious pathogenic environmental factors.

During the last 40-50 years, there was an idea of immunity as immunity to an infectious agent (from the Latin immunitas - release from duties) - microorganisms and their toxins.

R.V. Petrov considers immunity as a means of protecting the body from living bodies and substances that carry signs of genetically alien information. Therefore, immunity is protection against the foreign, that is, the ability to recognize the foreign in order to preserve the homeostasis of the body.

The tuberculin reaction is referred to the phenomenon of hypersensitivity of the delayed type (HST), because it begins to manifest no earlier than 6 hours after the introduction of tuberculin. The decisive factor of an allergic reaction can be microbial antibodies (BCG test) and tuberculin. Tuberculin diagnostics is based on the determination of tuberculin allergy - the increased sensitivity of a person to tuberculin, which occurs as a result of infection with virulent tuberculosis mycobacteria or BCG vaccination. The tuberculosis or vaccine process is accompanied by increased sensitivity to tuberculin, which is especially clearly manifested on the skin at the place of its introduction in the form of positive tuberculin reactions.

The use of tuberculin samples for the purpose of diagnosis and differential diagnosis, determination of infection and primary infection with tuberculosis, as well as selection of persons for BCG revaccination, has found wide application in practice.

The basis of the development of the tuberculin reaction is the interaction of tuberculin and antibodies fixed on T lymphocytes.

The "antigen-antibody" complex activates lymphocytes that secrete lymphokines. The latter cause damage to the cells of the macroorganism with the release of biologically active substances, which cause the development of an infiltrate in the skin. Pathomorphologically, the tuberculin reaction is characterized in the first 24 hours by tissue swelling at the site of tuberculin injection, and later (72 hours) by a mononuclear reaction with a larger number of histiocytes. In case of hyperergic reactions with the presence of tissue necrosis, even elements of specific inflammation - epithelioid cells - are found in the cellular composition.

Tuberculin was first obtained by the prominent German scientist R. Koch in 1890. This tuberculin was called Koch's old tuberculin or ATK (ALT Tuberculinum Koch). This is a filtrate from a 6-8-week culture of mycobacteria of human and bovine tuberculosis, which grew on meat in peptonoglycerine broth, sterilized with running steam for 1 hour and thickened to 1/10 of the volume at a temperature of 90. An isotonic solution is used as a preservative sodium chloride with 0.25% carbolic acid. Chemically, tuberculin consists of protein, polysaccharide,

of lipoid fractions, nucleic acids of mycobacteria, as well as peptones of the broth on which mycobacteria grew. Peptones can cause non-specific reactions. Tuberculin belongs to the class of haptens. The main requirements for tuberculin are specificity and standardization of its activity. The specifically active beginning of ATK is only 1% of the entire mixture, the last 99% are inert substances. A more specific preparation is dry tuberculin PPD-L (PPD-L), purified from medium proteins, (S
), (Protein Purified Derivative). This type of drug was first obtained in 1934 in the USA under the name RRD-5. In 1940, Seibert and Lillen produced a large series of purified tuberculin PPD-5, which in 1952 was approved by the World Health Organization as the international standard for dry purified tuberculin. In 1954, mass production of the drug PPD-L began.

Standard tuberculin is standardized in relation to the international one, taking into account the intensifying twine - 80 PPD-HT-23 by order of the WHO and is widely used by all countries of the world.

PPD-L with an indication of its activity in international tuberculin units "TO" with the addition of 0.005% tween-80 as a stabilizer, 0.01% quinozol solution as a preservative is a transparent colorless liquid, which is made by diluting the powder in a standardizing solvent.

In 1954, the WHO approved the international unit (TO) for PPD-L (1 TO contains 0.00002 mg of the pure drug and 0.000008 mg of buffer salts as impurities). An approved standard of purified tuberculin with an international unit of activity of 0.00006 mg.

The use of ready solutions of tuberculin in ampoules is important for the uniformity and accuracy of tuberculin diagnostics. In 1965, purified tuberculin was obtained in a solution standardized in relation to the international standard.

The international unit (IU) is the amount of tuberculin that can be administered without fear of very strong reactions in the research contingent, and which is able to detect 80-90% of positive reactions in spontaneously infected persons with tuberculosis. The shelf life of the drug is 12 months at a storage temperature of 0 to 4 C.

The above shows that tuberculin diagnostics is a biological test based on the specific ability of tuberculin to cause in the body of animals and humans sensitized by mycobacterium tuberculosis inflammatory-allergic reactions of a delayed type, which are quantitatively and qualitatively manifested individually.

With tuberculosis infection, the following allergic reactions are recognized: hyperergy - increased reaction to tuberculin; normergy - a moderate reaction to tuberculin; hypoergy - weak reaction and anergy - lack of reaction. Anergy is positive when the infected organism has a higher immunological reactivity. As a result, previously positive tuberculin samples become negative. And negative, when previously positive tuberculin tests turn negative due to a sharp decrease in immunity (meningitis, miliary tuberculosis).

The intensity of tuberculin reactions depends on many factors. These include the virulence and massiveness of the infection, the degree of natural resistance, the functional state of the neuro-endocrine system, household conditions, etc.

Mass tuberculin diagnostics. For mass tuberculin diagnostics, the intradermal Mantoux test with 2 TO PPD - L is used. It is performed: for the timely detection of tuberculosis patients; to identify infected with mycobacteria

tuberculosis of persons with an increased risk of the disease (primary infection with hypergic reactions to tuberculin); for the selection of contingents to be revaccinated with the BCG vaccine.

Mass tuberculin diagnosis is carried out in the following sequence: 1. Selection of contingents for examination taking into account contraindications.

2. Preparation of tools. 3. Technical execution of the test. 4. Evaluation of Mantoux test results.

5. Implementation of curative and preventive measures based on the conducted research.

In organized teams, mass tuberculin diagnosis is carried out by a special team (a doctor and 2 nurses), the formation of which is entrusted to polyclinics. In order to exclude the influence of seasonal and other factors on sensitivity to tuberculin, tuberculin diagnostics should be carried out at the same time of the year, preferably in autumn. In cases where the tuberculin test should be performed 3-4 weeks after the Schick test, the administration of gamma globulin, 4-6 weeks after the acute infectious disease.

Practically healthy children who have no contraindications, starting from 1 year of age and up to 14 years of age (depending on the epidemic situation in the region), are subject to annual examination for the purpose of early detection of tuberculosis. Contraindications to performing a tuberculin Mantoux test are acute infectious diseases, chronic infectious and allergic diseases (rheumatism, bronchial asthma), idiosyncrasy, skin diseases, epilepsy.

72 hours after setting the sample, measure the transverse diameter of the infiltrate relative to the axis of the hand using a transparent ruler.

The reaction is evaluated by quantitative and qualitative indicators. Quantitative evaluation is characterized by the size of the infiltrate in millimeters, qualitative – by the color of the infiltrate, the presence of vesicles, lymphangitis, necrosis, daughter rashes. According to the quantitative assessment of samples, reactions are distinguished:

- negative - there are no other manifestations at the site of tuberculin injection, except for the reaction from the injection;
- doubtful - hyperemia of any size, or an infiltrate up to 4 mm in size;
- positive - infiltrate with a diameter of 5 mm or more.

A hyperergic reaction is considered: in children and adolescents, the size of the infiltrate is 17 mm or more; in adults - 21 mm or more, as well as any size of the infiltrate, but with the presence of vesicles - necrotic reactions, lymphangitis, daughter rashes. When evaluating tuberculin reactions, factors affecting its intensity should be taken into account. Decreased sensitivity to tuberculin is noted in measles, whooping cough, scarlet fever, malaria, cancer, lymphogranulomatosis, sarcoidosis, and myxedema. Increase - with bronchial asthma, rheumatism, base disease, flu, with exacerbation of chronic diseases.

Post-vaccination allergy usually develops in the first year after vaccination (BCG revaccination). Most children and adolescents have a positive Mantoux reaction with an infiltrate of 5-11 mm. The infiltrate in these cases is flat, does not rise above the skin, is vaguely defined, fades quickly, and does not leave a pigment spot. There are no clinical manifestations of intoxication symptoms. A characteristic tendency to weaken the Mantoux reaction a year or more after vaccination. An indication in the anamnesis of contact with a tuberculosis patient is an important circumstance that confirms infection. For much later

the period of appearance of a positive Mantoux test, its more pronounced nature (infiltrate 11 mm in diameter with the presence of clinical signs of the disease) more indicate the increase of primary infection. It should be remembered that in the absence of a trace of BCG vaccination or a scar size of 1-2 mm, the post-vaccination allergy in most children is very weak and quickly fades away. If difficulties arise in differential diagnosis, such children should be taken under the supervision of a dispensary.

Extrapulmonary tuberculosis. Primary lesions of the mucous membrane of the oral cavity, tongue, larynx and cervical lymph nodes are rare. More often, tuberculosis of the oral cavity, larynx, peripheral lymph nodes occurs as a secondary lesion against the background of tuberculosis of the skin, lungs, etc.

Three forms of tuberculosis of the oral cavity are observed: tuberculous lupus, miliary-ulcerative tuberculosis and its collicative form, which is not very common.

On the mucous membrane of the oral cavity, tuberculosis manifests itself mainly secondarily.

Primary tuberculosis of the mucous membrane of the oral cavity is practically not found, because the mucous membrane of the oral cavity is not favorable to mycobacterium tuberculosis, although the results of research indicate that it can become infected even if it is intact when in contact with mycobacterium tuberculosis.

The emergence of a primary tuberculosis complex on the mucous membrane of the oral cavity is possible in children at the site of invasion of the pathogen. In this case, a painful ulcer of 10–15 mm in size appears, with pitted uneven edges and a dirty gray bottom. It is accompanied by regional lymphadenitis.

After 3-5 weeks, the ulcer gradually disappears, even without treatment.

More often, tuberculosis of the mucous membrane of the oral cavity occurs as a secondary lesion against the background of tuberculosis of the lungs and other organs.

Tuberculosis of the oral cavity is observed in the form of the following forms: tuberculous lupus, miliary-ulcerative and colliquative tuberculosis.

Tuberculous lupus (Lupus vulgaris).

It is the most common form of secondary tuberculous lesions of the maxillofacial area.

The main primary element of tuberculous lesions of the mucous membrane of the oral cavity is a lipoma - a specific tubercular tubercle (tuberculum) of red or yellow-red color, soft consistency, 1–3 mm in diameter. Lipomas are arranged in groups: fresh on the periphery, and those located in the center are prone to cheesy decay and fusion with neighboring bumps. At the same time, shallow ulcers are formed with soft uneven, pitted, swollen, slightly painful edges, lined with bright red or yellow-red papillomatous crimson growths, which bleed easily and are covered with a clear or yellowish coating.

Tuberculous lupus progresses slowly and passes through the infiltrative, tubercular, ulcerative and scar stages.

Lesions from tuberculous lupus are located mainly on the skin of the face (in the form of a "butterfly"), spreading to the upper lip, red border, less often - to the mucous membrane of the gums and alveolar sheath of the upper jaw in the area of the front teeth, hard and soft palate, upper lip and cheeks, where the lesion is represented by an ulcer of an irregular shape with pitted edges and a bottom with bleeding granulations.

Sometimes the process is localized only on the red border. The lip increases in volume due to swelling, becomes dense, cracks and ulcers appear on it, which are covered with bloody and purulent crusts.

According to the location on the mucous membrane of the gums, I.H. Lukomsky distinguishes 4 types of lesions in tuberculosis.

1. *Marginal*. Covers the gingival margin first in the form of infiltration, then turns into a bumpy-erosive form. The mucous membrane of the gums acquires a bright red color, the gingival margin and interdental papillae swell sharply, the contours of the gingival margin are smoothed, the gums seem to be pricked with pins, painful. Matte shade, bleeds easily.

2. *Supramarginal*infiltrative or tuberous-ulcerative lesion that does not extend to the edge of the gums. In place of the scars left as a result of the healing of ulcers, new lipomas appear, and then ulcers of an irregular shape with a bottom covered with a grayish-yellow coating.

If the process is localized on the lip, it becomes dense, cracks and ulcers appear on it, which are covered with bloody and purulent crusts.

3. *Total*. Sometimes the entire gum surface is involved in the process. It has an infiltrative, more often - erosive or ulcerative character. At the same time, the bone tissue of the alveolar process is quite often affected, the teeth become mobile and fall out, the picture of "hypertrophic lupus gingivitis" may develop. Regional lymph nodes are enlarged and thickened.

4. *Bilateral*. It develops as ulcerative lupus, in which there is often a combined lesion of the gums, palate, tongue and lips with the typical dynamics of a tubercular lesion: nodules → decay → scar.

Diagnosis of the disease is facilitated by the presence of "apple jelly" symptoms typical of tuberculous lupus (with diascopy) and probe failure.

When pressing with a glass slide on the skin or the red border of the lips, the affected tissue bleeds and lipomas in the form of yellow-brown nodules become clearly visible (resembling apple jelly), and when pressing with a button probe on the tubercle, the probe falls into the lipoma - Pospelov's phenomenon, test with a probe.

Regional lymph nodes increase in size, become dense, and become lumpy bundles. Tuberculin tests are usually positive. Tuberculosis mycobacteria are rarely found.

Pathological examination reveals typical tuberculous nodules with epithelioid cells, Pirogov-Langhans giant cells, and peripheral lymphocytes. Caseous necrosis is weakly expressed or absent at all. The inflammatory infiltrate consists of lymphocytes and plasma cells.

Tuberculous lupus is distinguished by:

• with tuberous lesions in primary syphilis (in which the tubercles are dense and, unlike tuberculous lupus, never re-form on scars, Pospelov's symptom is negative);
• with leprosy;
• with lupus erythematosus.

The latter is characterized by the absence of lupus, but the presence of erythema, hyperkeratosis, and cicatricial atrophy.

Treatment is carried out with a combination of anti-tuberculosis drugs
anti-tuberculosis institutions.

Local treatment:

1. Getting rid of local traumatizing factors.
2. Sanitation of the oral cavity.
3. Application with antiseptics and anti-inflammatory drugs.

Miliary-ulcerative tuberculosis(tuberculosis miliaris ulcerosa) is a variant of secondary tuberculous lesion of the mucous membrane of the oral cavity, which develops against the background of decreased reactivity.

Tuberculosis mycobacteria, which are secreted in significant quantities with sputum, with a severe progressive course of the pulmonary process, from open foci of infection (more often from caverns) take root in the mucous membrane (usually in places of injuries) of the cheeks along the line of closure of the teeth, back and lateral surfaces of the tongue, soft palate. At the same time, typical tuberculous tubercles appear, the further development of which is accompanied by disintegration in the center and the formation of a shallow, initially small, with uneven undercut soft edges, very painful ulcer, which has a creeping character and grows along the periphery. Sometimes it reaches large sizes. The bottom and edges of the ulcer have a granular character (due to the tubercles), covered with a yellow-gray coating. The tissues surrounding the ulcer are swollen. On the periphery of the ulcer surface, it is possible to detect small abscesses, so-called grains or bodies of Trel.

In the case of a long-term existence of an ulcer, a secondary infection joins and its edges and bottom become dense. On the tongue and transitional folds, ulcers have the form of slits with inwardly turned edges. Lymph nodes may not be palpable at the beginning of the ulcer, but later increase in size, become dense and elastic, and painful.

The presence of intoxication syndrome, the detection by cytological examination among the inflammatory elements of Pirogov-Langhans giant cells and epithelioid cells, mycobacterium tuberculosis help to confirm the tuberculous etiology of the process.

Miliary-ulcerative tuberculosis should be differentiated from traumatic, decubitus, and trophic ulcers of the oral mucosa, erosions and ulcers when secondary syphilis rashes are complicated by secondary infection, gummy ulcers in tertiary syphilis, as well as Vincent's stomatitis and cancer of the oral mucosa.

Colicative tuberculosis(scrofuloderma) is a rarer form of secondary tuberculosis, occurs mainly in children. A typical sign of this form is the formation of nodes in the deep layers of the mucous membrane, which eventually disintegrate. At the same time, ulcers of an irregular shape, soft consistency, with eaten, pitted edges and flaccid granulations at the bottom appear. The ulcer is not painful, when it heals, uneven, so-called shaggy scars are formed.

The colicative form of tuberculosis of the mucous membrane of the oral cavity should be differentiated from a gum ulcer, the bottom of which also contains granulations. However, its edges are crater-like, sticky, painless. After the ulcer heals, a retracted star-shaped scar remains. Nodes in the case of actinomycosis are characterized by a sharp board-like stickiness, the presence of fistulas, in the secretions of which drusen of the ray fungus are found.

Cancerous ulcers occur in adulthood and are characterized by stickiness, tenderness, everted edges and the presence of atypical cells during cytological examination.

Treatment of tuberculosis of the mucous membrane of the oral cavity is carried out by a dentist against the background of general therapy prescribed by a phthisiologist.

Sanitation of the oral cavity, elimination of traumatizing factors, treatment of teeth, periodontal pathology is a prerequisite for local therapy of tuberculous lesions of the mucous membrane of the oral cavity. Antiseptic, necrolytic agents, specific anti-tuberculosis drugs and agents that improve the reparative properties of tissues are used.

Materials on the activation of students of higher education during the lecture: questions, situational tasks.

Question:

- Specify the examination plan for a tuberculosis patient and give an interpretation of X-ray laboratory data.
- Explain the pathogenesis of tuberculosis of the mucous membrane of the oral cavity and maxillofacial localization.
- List the clinical forms of tuberculosis of the mucous membrane of the oral cavity and maxillofacial localization.
- What diseases are most often differentiated tuberculosis of the mucous membrane of the oral cavity and maxillofacial localization.

General material and methodical provision of the lecture.

- Educational premises - lecture hall of the department.
- The equipment is a negatoscope, a slidescope.
- Illustrative materials - slides, tables, models, radiographs, tomograms, patients and their stories.

Questions for self-control.

1. What diagnostic methods are used to diagnose "tuberculosis"? 2. What changes are detected when examining blood, sputum, and X-rays?
3. Pathogenesis of tuberculosis of the mucous membrane of the oral cavity and maxillofacial region.
4. Features of the clinical course of tuberculosis of the mucous membrane of the oral cavity and maxillofacial region.
5. List the main clinical forms of tuberculosis of the mucous membrane of the oral cavity and maxillofacial area.
6. With what diseases should tuberculosis of the mucous membrane of the oral cavity and maxillofacial area be differentiated?

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Independent work of the acquirer

Topic 1.
Epidemiology, etiology, pathogenesis of tuberculosis. Clinical classification of tuberculosis.

Goal: Familiarize yourself with issues of epidemiology of tuberculosis, types of the causative agent and forms of its existence, pathogenesis of primary and secondary forms of tuberculosis, clinical classification of tuberculosis.

Basic concepts: Epidemiology, etiology, pathogenesis of tuberculosis. Clinical classification of tuberculosis

Plan

1. Theoretical questions.

Epidemiology. Due to the rapid increase in the incidence of tuberculosis and mortality from it worldwide, the spread of drug resistance of mycobacterium tuberculosis to the main anti-tuberculosis drugs since the beginning of the 90s, the WHO in 1993 declared a global danger from tuberculosis.

In 1995, the WHO recorded a tuberculosis epidemic in Ukraine, as the number of patients exceeded 1% of the population. The epidemic progresses unceasingly and acquires threatening proportions. Statistics show that 82 new tuberculosis patients are registered in Ukraine every day, and 30 patients die. The incidence of all forms of tuberculosis in 2006 was 83.2 cases per 100,000 population (in 2002 – 75.6).

The main route of tuberculosis infection is the aerogenous route. Knowledge of the ways of tuberculosis infection, the main sources of tuberculosis infection allows to successfully carry out preventive measures.

Timely diagnosis of tuberculosis is possible if the students know and possess the skills of examination of patients, the ability to correctly interpret the received data, objective laboratory and X-ray examination, knowledge of the clinical classification of tuberculosis.

to fight tuberculosis in Ukraine great attention is paid to the issue prevention of tuberculosis, which covers both children and adults of the country Actuality. According to WHO criteria, Europe is divided into three categories according to the level of tuberculosis incidence:

- low-prevalence countries, where the incidence rate is lower than 10 cases per 100,000 population, which include Germany (8.0), Finland (9.0), Italy (7.0), Switzerland (7.0), Monaco 0.8), Israel (9.0);
- countries with an average level of distribution. These are Austria (14.0), Belgium (14.0), Hungary (29.0), Turkey (26.0), Spain (27.0), Czech Republic (12.0), France (12.0), Greece (20.0), Slovakia (24.0). Their incidence rate ranges from 10 to 30 cases per 100,000 population.
- countries with a high level of prevalence, where the incidence rate is higher than 30 cases per 100,000 population. These countries include 15 former USSR countries (Belarus 53.0; Estonia 50.0; Georgia 83.0; Kazakhstan 145.0; Kyrgyzstan 124.0; Latvia 75.0; Lithuania 70.0; Republic of Moldova – 139.0 ; Ukraine 63.4.0 and Romania (149.0), Bulgaria (43.0), Poland (31.0). Figures are for 2003.

Negative trends in the epidemiological situation of tuberculosis are caused primarily by negative reasons of a socio-economic nature, a health care crisis and a decrease in the effectiveness of anti-tuberculosis measures, the spread of HIV infection and chemoresistant tuberculosis.

The outstanding merit in the development of the doctrine of tuberculosis belongs to the German scientist Robert Koch. In 1882, R. Koch discovered the causative agent of tuberculosis, which was named after him

honor with "Koch's wand". This discovery was grand at the time (1/7 of humanity was dying of tuberculosis at that time) and the scientist was awarded the Nobel Prize (1911)

The causative agent of tuberculosisbelongs to the genus Mycobacterium of the family Mycobacteriaceae, order Actinomycetalis. It is known that there are several types of mycobacteria that cause tuberculosis in humans and animals: Mycobacteriumtuberculosis (human species), Mycobacteriumbovis (bovine species), Mycobacteriumafricanum (intermediate species). In 92% of cases, tuberculosis in humans is caused by M. tuberculosis, in 5% by M. bovis, and in 3% by M. africanum.

Tuberculosis mycobacteria are thin or straight slightly curved rods 1-10 (more often 1-4) microns long, 0.2-0.6 microns wide, homogeneous or granular with slightly rounded ends. They are immobile, will not form endospores, conidia and capsules.

Tuberculosis bacilli are acid-alcohol- and alkali-resistant. These qualities are used in painting. They perceive dyeing very difficult, but after being dyed, they do not discolor even under the influence of alcohols and acids. The most common staining method is the Ziel-Nielsen method.

The morphology and size of bacterial cells vary significantly, which depends on the age of the cells and especially on the conditions of existence and composition of the nutrient medium. With the help of electron microscopy, the main structural elements of tuberculosis mycobacteria were identified: cell wall, cytoplasmic membrane and its derivative - mesosome, cytoplasm, nuclear substance - nucleotide.

One of the types of variability of many bacteria is the formation of L-forms. The essence of L-transformation is that under the influence of adverse factors, the microbial cell loses its cell wall structure partially or completely. In the first case, the microorganism becomes defective in the cell wall, in the second case, it changes into the form of a spheroplast or protoplast, loses the ability to reproduce and dies. The ability to form L-forms has also been proven in mycobacterium tuberculosis. At the same time, it was found that the transformation of mycobacteria into L-forms is enhanced under the influence of anti-tuberculosis drugs. In the sputum of "abacilar" patients with destructive forms of tuberculosis, L-forms of mycobacteria can be found, which are able to stay in the body for a long time and in the future, under appropriate conditions, revert to the rod-shaped version.

Tuberculosis mycobacteria are very resistant to environmental factors. In natural conditions, in the absence of sunlight, their viability can be preserved for several months, with diffused light, pathogens die in 1-1.5 months. In street dust, MBTs are stored for up to 10 days, on the pages of books - up to 3 months. in water - to
5 months Mycobacteria die in the sunlight, so infection with tuberculosis outside the premises during the day is unlikely. Direct sunlight kills M. tuberculosis within 5 minutes. A 1% solution of sodium hypochlorite dissolves sputum and quickly kills mycobacteria in it, while in a 5% solution of phenol, this pathogen remains viable for several hours. At 60°C, mycobacteria survive for 20 minutes, at 70°C for 5 minutes.

Tuberculosis mycobacteria can enter the body in different ways: aerogenously, enterally (through the gastrointestinal tract), through damaged skin and mucous membranes, through the placenta during fetal development. However, the main route of infection is aerogenous.

Pathogenesis. Unlike endotoxins, exotoxins or enzymes, which are determined in the cells of many other pathogenic organisms, the damaging effects of tuberculosis are largely determined by the body's protective reactions in response to the presence of mycobacteria in the tissues. In order to survive, mycobacterium tuberculosis must stimulate its capture by macrophages. In the phagosome of the alveolar macrophage, MBT begin to multiply, as a result of which the cell of the macroorganism is completely destroyed. As a result of the production of ATP-positive protons and mycobacterial sulfatides, bacteria prevent the fusion of the phagosome with the lysosome and are able to avoid destruction by macrophages. MBT reproduce slowly (within 15-18 hours). But

uncontrolled reproduction can lead to the appearance of a large number of mycobacteria - more than 500 million within 20 days. In those cases when the digestion process of mycobacteria is blocked, macrophages are destroyed and mycobacteria leave the cells. Macrophages secrete into the extracellular space fragments of destroyed mycobacteria, proteolytic enzymes, and mediators that activate T-lymphocytes. In this way, an immune response is formed, which plays an important role in the pathogenesis of the tuberculosis process.

Local changes at the site of MBT penetration are caused primarily by the reaction of polynuclear cells, which is replaced by a more advanced form of protective reaction involving macrophages. They carry out phagocytosis and destroy mycobacteria. The result of the interaction of macrophages and mycobacteria is determined by the state of immunity, the level of PCST, which develops in the process of tuberculosis infection, as well as other factors, including those that determine the digestive ability of macrophages.

From the macrophages, mycobacteria enter the lymphatic vessels draining the lung and form separate foci in the lymph nodes at the root of the lung, and then through the thoracic duct they can spread through the blood vessels to various organs. The bacteremia phase is asymptomatic. After 3-6 weeks, an infected person develops hypersensitivity to the causative agent, and granulomatous inflammation with the development of a tuberculous granuloma occurs in the foci of MBT, in the center of which is an area of caseous necrosis (caseosis), surrounded by epithelioid and multinucleated (giant) Pirogov-Langhans cells.

As a result of the first meeting of the pathogen with the macroorganism, primary tuberculosis is formed - 7-10% of infected people are not able to create a full-fledged immune response. Others react to a primary tuberculosis infection without clinical manifestations, they are determined only by a change in tuberculin reactions. The period from the moment of penetration of mycobacterium tuberculosis until the appearance of a positive reaction to tuberculin is called the period of "latent microbism". It lasts an average of 4-6 weeks.

After primary tuberculosis, hematogenous or lymphogenous dissemination is possible with the detection of foci of productive inflammation in the lungs.

With repeated encounters of the macroorganism with MBT, accompanied by endogenous reactivation of old foci, secondary tuberculosis is formed, which has an organic nature and is manifested by the formation of a foci, infiltrate or cavern without involvement of lymph nodes in the process. The basis of reactivation is the progressive reproduction of the bacterial population and an increase in the number of mycobacteria. However, until now it remains unknown what exactly and what conditions contribute to the reversion of the tuberculosis pathogen, which was in a persistent state. It has been established that the reactivation of tuberculosis and the development of its various clinical forms are more often observed in persons with residual changes in the presence of factors that reduce immunity. Another way of secondary tuberculosis development is also possible – exogenous, associated with new (repeated) infection with tuberculosis mycobacteria (superinfection). However, even with the exogenous path of development of secondary tuberculosis, the penetration of mycobacteria into an already infected body is not enough, even with a massive repeated superinfection. A combination of conditions and risk factors that reduce immunity is necessary.

The principles of creating the classification of tuberculosis are closely related to the achievements of medicine in one or another period of the development of science. The grouping of diseases by a certain sign or a number of signs is carried out for the purpose of unifying the diagnosis and treatment of patients, compiling statistical reports and determining the prognosis of the disease. It corresponds to the International Statistical Classification of Diseases (ICSD) X revision, recommended by WHO since January 1, 1993, approved by Order No. 384 of the Ministry of Health of Ukraine dated 06.09.06.

CLINICAL CLASSIFICATION OF TUBERCULOSIS

I. Type of tuberculosis process:

1. Tuberculosis diagnosed for the first time - VDTB.
2. Relapse of tuberculosis - RTB.
3. Chronic tuberculosis - CTB.

II. Clinical forms of tuberculosis:

(IC codes – 10 revisions)

A15.- A16.- Pulmonary tuberculosis (TB)

A15.- A16.- Primary tuberculosis complex A19.-
part Disseminated pulmonary tuberculosis A15.-
A16.- Focal pulmonary tuberculosis
A15.- A16.- Infiltrative pulmonary tuberculosis
A15.- A16.- Caseous pneumonia
A15.- A16.- Tuberculoma of the lungs
A15.- A16.- Fibrous-cavernous pulmonary tuberculosis
A15.- A16.- Cirrhotic pulmonary tuberculosis
A15.- A16./J65 – Pulmonary tuberculosis combined with occupational dust diseases of the lungs (coniotuberculosis)

A15.- A18.- Extrapulmonary tuberculosis (PTB)

A15.- A16.- Tuberculosis of bronchi, trachea, larynx and other upper respiratory tracts
A15.- A16.- Tuberculosis of intrathoracic lymph nodes
A15.- A16.- Tuberculous pleurisy (including empyema)
A17.- Tuberculosis of the nervous system and meninges
A18.0.- Tuberculosis of bones and joints
A18.1.- Tuberculosis of the genitourinary system
A18.2.- Tuberculosis of peripheral lymph nodes
A18.3.- Tuberculosis of intestines, peritoneum and mesenteric lymph nodes
A18.4.- Tuberculosis of skin and subcutaneous tissue
A18.5.- Tuberculosis of
the eye A18.6.-
Tuberculosis of the ear
A18.7.- Tuberculosis of adrenal glands
A18.8.- Tuberculosis of other specified organs and
systems A19.- Miliary tuberculosis
A18.- Tuberculosis of unknown location

III. Characteristics of the tuberculosis process:

1. **Localization of the lesion**
   The localization of the lesion in the lungs is indicated by the number (name) of the segments, the name of the lobes of the lung; and in other organs and systems - by the anatomical name of the lesion site.
2. **Presence of**
   destruction(Destr+) available
   destruction(Destr-) does not
   exist destruction
   Optionally, the phase of the tuberculosis process should be noted:

- infiltration, decay, insemination;
- resorption, compaction, scarring, calcification (calcification).

3. **Etiological confirmation of the diagnosis of tuberculosis**
   (MBT+) confirmed by the results of a bacteriological examination (code A15), in this case specify:
   (M+) positive smear test result for acid-fast bacteria (CBS); (K0) cultural research
   was not conducted;
   (K-) negative result of cultural research;
   (K+) positive result of cultural research; in this case, specify the resistance
   (Hist0) histological examination was not performed;
   (Hist-) not confirmed by the results of a histological examination (code A16); (Hist+)
   confirmed by the results of histological examination (code A15). IV. Complications of
   tuberculosis:

Complications of pulmonary tuberculosis (TB):hemoptysis, pulmonary hemorrhage, spontaneous pneumothorax, pulmonary insufficiency, chronic pulmonary heart disease, atelectasis, amyloidosis, etc.

Complications of extrapulmonary tuberculosis (PTB):bronchial stenosis, pleural empyema, fistula (bronchial, thoracic), renal (adrenal) failure, infertility, adhesions, ankylosis, amyloidosis, etc.

V. Clinical and dispensary category of patient registration. VI. Effectiveness of treatment of patients with tuberculosis VII. Consequences of tuberculosis:

Residual changes after cured pulmonary tuberculosis:fibrotic, fibrotic-focal, bullous-dystrophic, calcifications, pleuropneumosclerosis, cirrhosis, consequences of surgical intervention (indicating the type and date of surgery), etc.

Residual changes after cured extrapulmonary tuberculosis:cicatricial changes in various organs and their consequences, calcification, consequences of surgical intervention (indicating the type and date of surgery).

Questions for self-control.

1. What is tuberculosis as a disease? Give a definition.
2. What are the negative trends in the epidemiological situation of tuberculosis in Ukraine?
3. What types of MBT cause tuberculosis in humans and animals?
4. What are the main properties of MBT?
5. What are the main ways of infecting a person with tuberculosis?
6. What morphological changes occur in the focus of tuberculous inflammation?
7. What is the L-transformation of MBT?
8. What clinical forms are primary forms?
9. What clinical forms are secondary forms?
10. What phases characterize the activity of tuberculosis changes in patients?
11. What phases reflect the subsidence of active tuberculosis?

Indicative tasks for processing theoretical material

Orientation map regarding the student's independent work with literature on the subject of the lesson

No	Main tasks	Instructions	Answers
1.	**to learn** The causative agent of tuberculosis	Specify pathogenic types of MBT, properties of MBT, forms of existence.	
2.	Sources tuberculosisinfections	Specify known sources tuberculosisinfections	
3.	Paths infectiontuberculosis	To indicate the ways of tuberculosis infection and their importance in the development of tuberculosis.	
4.	Pathogenesis of primary andsecondary form stuberculosis	1) Define "primary tuberculosis" and specify the features of the course; 2) Define "secondary tuberculosis" and specify the features of the course	
5.	Morphological changes in the focus of tuberculous inflammation	Specify the structure of the tubercular tubercle	
6.	Clinical classificationt	Specify the main units clinicalclassification of tuberculosis.	

	uberculosis		

Practical works (tasks) to be performed.
Discussion of theoretical issues in the form of answers to the questions, debates, discussions, presentations with reports, abstracts, discussion of reports and abstracts, review of the answers of students of higher education, etc.

3. Test tasks for self-control
1. The child had contact with his father, who was suffering from destructive pulmonary tuberculosis. During the examination at the tube dispensary, the child was found to have a tuberculin test - an infiltrate of 15 mm in diameter. Probable route of infection?

A. Contact B.
Aerogenic S.
Sexual
D. Alimentary
E. Transplacental

2. A 7-year-old child fell ill with the primary form of tuberculosis. Which of these forms is primary according to clinical classification?

A. Focal tuberculosis
B. Primary tuberculosis complex S.
Tuberculoma of the lungs
D. Infiltrative tuberculosis E.
Caseous premonia

3. After a 6-month course of treatment in the hospital, the patient was discharged with the diagnosis: "Focal tuberculosis of the right upper lobe in the phase of resorption and calcification. MBT(-)" What bacterial subpopulations of MBT prevail in the remaining foci?

A. Actively - reproducing. B.
Slowly metabolizing.
C. Persistent L-forms. D.
Alpha forms.
E. Ultra-small forms.

Clinical tasks:
Task No. 1 In a 30-year-old patient, a round shadow up to 5 cm in diameter, of medium intensity with clear even contours and a sickle-shaped light was detected by fluorography in the II segment of the right lung. In the surrounding lung tissue and in the lower lobe on the right, individual low-intensity focal shadows are determined. MBT was detected in the sputum. A diagnosis of tuberculosis was established.
Question:
1.What is the form of the tuberculosis process?
2. What is the phase
of the process?
Standards of answers:
1. secondary tuberculosis 2.
phase of decay and
insemination

Task #2. . Patient. 38 years old. He complains of an increase in body temperature up to 37.2ºC, weakness, increased sweating, cough with sputum. Radiologically, in S1,2,3 of the right lung, an infiltrative shadow with a decay cavity and foci of insemination in S6 was determined

healthy lungs. Tuberculosis mycobacterium was detected in the sputum. The patient wasa clinical diagnosis of tuberculosis was established.

Question:

1. Which diagnosis fully corresponds to the classification?
2. What phase does the abbreviation Destr+ correspond to?

4. Individual tasks for students of higher education on the topic

Topics of reports/abstracts:

- modern epidemiological situation in Ukraine and Odesa region;
- the history of the discovery of the causative agent of tuberculosis;
- explanation of the modern classification of tuberculosis

Note. When preparing a report, essay, analytical review, etc., students of higher education can, along with this, prepare didactic visual materials in the form of tables, code diagrams, slides, drawings, drug schemes, etc.

5. List of recommended literature (main, additional, electronic information resources):

Main:

1. Phthysiatry: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others] ; under the editorship V. I. Petrenko. Kyiv: Medicine, 2018. 471p.
2. Current issues of phthisiology: manual / D. G. Kryzhanoskyi, V. A. Freiwald, N. A. Marchenko (and others). Dnipropetrovsk: T.K. Serednyak, 2017. 155p.
3. Phthisiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. Kharkiv: KhNMU, 2016. 176 p.

Additional:

1. Prevention of tuberculosis. Study guide for students and interns of VNMZ IV accreditation level and doctors / V. I. Petrenko, M. G. Dolynska, A. V. Aleksandrin, V. V. Petrenko. Kyiv: 2 Print, 2017. 88 p. url:http://tb.ucdc.gov.ua/uploads/files/prophilaktica.pdf.

2. Emergencies in the practice of a phthisiopulmonologist: teaching. manual / N. A. Matsegora, O. Ya. Lekan, O. A. Baburina, M. Yu. Golubenko. Odesa: "Astroprint", 2016. 64 p.

3. Tuberculosis of bones and joints: method. recommendations for students and interns of VNMZ IV level of accreditation / N. A. Matsegora, O. Ya. Lekan, L. P. Omelyan [and others]. Odesa: ONMedU, 2018. 24 p.

4. Extrapulmonary and miliary tuberculosis in patients with TB/HIV co-infection / V. I. Petrenko, M. G. Dolynska, O. M. Raznatovska. K. 2015: DCS Center. 112 p. URL: http://tb.ucdc.gov.ua/uploads/files/usaid_170x240_fp_new.pdf

5. Palliative and hospice care for patients with tuberculosis: a study guide (University of the IV year) / Yu. I. Feshchenko, V. M. Knyazevich, O. M. Raznatovska, HA Hrytsova / Kyiv. 2017. 98 p.

6. Biochemical Value Dynamics in Patients with Multidrug-Resistant Tuberculosis/HIV with CD4+ Lymphocyte Cells below 50 Cells/μCLandits Variability in the Application of Adjuvant Immunoglobulin Therapy / NA Matsegora, AV Kaprosh, PB Antonenko // International Journal of Mycobacteriology. 2019; 8 (4):374 - 380. (SCOPUS)

7. Global tuberculosis report 2019 (WHO/CDS/TB/2019.15). Geneva, World Health Organization. 2019 URL: https://apps.who.int/iris/bitstream/handle/10665/329368/9789241565714-eng.pdf

8. Order of the Ministry of Health of Ukraine No. 530 dated February 25, 2020 "Health care standards for tuberculosis".
URL:https://phc.org.ua/sites/default/files/users/user90/Nakaz_MOZ_vid_25.0 2.2020_530_Standarty_medopomogy_pry_TB.pdf

9. TUBERCULOSIS Clinical guidelines of the Ministry of Health of Ukraine, based on evidence

No. KN 2021-530from11/17/2021.URL: https://www.dec.gov.ua/mtd/tuberkuloz/
10. Order of the Ministry of Health of Ukraine No. 287 dated February 1, 2019 "On the approval of the Infection Control Standard for health care institutions that provide assistance to tuberculosis patients." URL:https://zakon.rada.gov.ua/laws/show/z0408-19#Text

Electronic information resources

1. Website of the Center for Public HealthMinistry of Health of Ukraine.http://phc.org.ua/2. Tuberculosis issues on the WHO website.http://www.who.int/tb/en/ 3. National tuberculosis resource center.http://tb.ucdc.gov.ua/

Topic 2

Organization of detection and diagnosis of tuberculosis. The role of the anti-tuberculosis dispensary. Tuberculin diagnosis. Clinical analysis of patients.

Basic concepts: Categories of the population with an increased risk of tuberculosis, signs of tuberculosis of the respiratory organs and extrapulmonary localization., symptom complexes that require a mandatory examination for tuberculosis, criteria for the diagnosis of tuberculosis, the role of the anti-tuberculosis dispensary in the detection of tuberculosis; the role of tuberculin diagnostics in timely detection of tuberculosis

Plan

1. Theoretical questions:

The purpose of diagnosing tuberculosis is aimed at interrupting the transmission of the causative agent of the disease and eliminating the sources of infection by identifying epidemiologically high-risk patients who secrete mycobacterium tuberculosis with sputum.

Improving the detection, diagnosis and treatment of tuberculosis is a priority area of development of the anti-tuberculosis care system.

In accordance with the concepts of the National programs for the fight against tuberculosis of various countries, including Ukraine, identification of tuberculosis patients is carried out in medical institutions of the general medical network by the staff of these institutions. The diagnosis of tuberculosis must be confirmed in a specialized anti-tuberculosis institution. At the same time, the goal of all measures is to identify, as much as possible, persons suspicious of tuberculosis with clinical or radiological symptoms, who should be examined to confirm or rule out the diagnosis of tuberculosis.

Timely diagnosis of respiratory tuberculosis is an important joint task of phthisiologists and doctors of many other specialties, the health and well-being of our society largely depends on its successful performance. At the same time, the competent use of modern diagnostic capabilities in conditions of general and fully justified phthisiatric vigilance will contribute to the reduction of cases of overdiagnosis of tuberculosis and possible iatrogenic consequences of unjustified antituberculosis therapy.

Since tuberculosis is an infectious disease, which is characterized by the formation of specific granulomas in organs and tissues, to verify the diagnosis, in addition to the symptoms characteristic of the disease, it is necessary to isolate the causative agent of tuberculosis - mycobacterium tuberculosis from pathologically affected organs and tissues or histological confirmation of the diagnosis. MBTs are released during the destruction of affected tissues as a result of caseous necrosis caused by the products of mycobacteria. Caseous necrosis is the last stage of tuberculous granuloma development. Before tissue decay, the release of MBT is unlikely. In this case, verification of the diagnosis is carried out histologically during a biopsy of the affected organ or by a set of indicators that most likely confirm the diagnosis of tuberculosis. Such indicators include: signs of tuberculosis, the course of the disease, exclusion of other diseases after differential diagnosis and a positive result from

anti-tuberculosis therapy, which is manifested by the regression of pathological changes in organs and tissues.

Signs of tuberculosis are determined by the symptoms inherent in the organs involved in the pathological process and pathological changes in these organs and tissues. Signs of tuberculosis of various localizations and criteria for its diagnosis are given in Tables 1-2.

According to clinical forms, pulmonary tuberculosis and extrapulmonary tuberculosis are distinguished. Instead of the stages that characterize the course of the disease, the type, localization and prevalence of the tubercular process, the phase of the process and the method of confirming the diagnosis are used to characterize the tubercular process.

Table 1 - Signs of tuberculosis of different localization

Localization tuberculosis	**Signs of tuberculosis**
Tuberculosis differ entlocalization	Intoxication syndrome (febrile or subfebrile temperature ture, loss of body weight, pallor, weakness, etc.), symptoms characteristic of the organs involved in the pathological process.
Pulmonary tuberculosis	Intoxication syndrome, cough, expectoration, hemoptysis, chest pain, pathological changes in the lungs X-rays of chest organs.
Extrapulmonary tuberculosis:	
Tuberculosis of intrathoracic lymph nodes	Intoxication syndrome (from sharply expressed to moderately expressed), cough, sputum discharge, expansion of the shadow of the roots of the lungs on the X-ray of the chest organs, lesions bronchi during bronchoscopy.
Tuberculous pleurisy	Intoxication syndrome (segment expressed year-on-year pronounced), pain in the chest, shortness of breath, dry cough, the presence of effusion in the pleural cavity.
Tuberculosis of the nervous systemsystems andmeninges	Intoxication syndrome (segment of the expressed moderatelyexpressed), meningeal syndrome (from sharply expressed to moderately pronounced), pathological changes in the cerebrospinal fluid, focal symptoms of brain damage.
Tuberculosis bones and joints	Intoxication syndrome, local pain in bones and joints, cold abscesses in soft tissues, pathological changes in bones and joints during X-ray examination.
Tuberculosis peripheral lymph nodes	Intoxication syndrome, enlargement of peripheral lymph nodes, fistula over enlarged peripheral lymph nodes.
Miliary tuberculosis	Intoxication syndrome (sharply expressed), miliary rashes in lungs during X-ray examination.

Table 2 — Criteria for the diagnosis of tuberculosis

Diagnosis of tuberculosis of different localization:	**Criteria for the diagnosis of tuberculosis**
Tuberculosis MBT+	Signs of tuberculosis of organs or tissues, detection of MBT by microscopy or culture in material obtained from affected organs and tissues.
Tuberculosis HIST +	Signs of tuberculosis of organs or tissues, histological verification of tuberculosis during biopsy of affected organs and fabrics

Tuberculosis MBT -	Signs of tuberculosis of organs or tissues, positive result from the use of anti-tuberculosis therapy (regressionpathological changes in affected organs and tissues).

Detection of tuberculosis by screening fluorography or smear microscopy among at-risk adults

It is conducted by polyclinic departments of any profile. Rthe entgenological department (cabinet) keeps a file or computer record of the population of the district from risk groups, which is subject to fluorographic examination, and organizes its examination. Detection of tuberculosis by means of screening fluorography is carried out only in medical and social risk groups (Table 4).

Identification of patients with tuberculosis of the respiratory organs is carried out during the examination of patients who sought primary medical care with complaints and/or symptoms suspicious for tuberculosis (table 3).

Clarification of contingents subject to active examination for tuberculosis is carried out by employees of medical institutions of the general medical network and sanitary-epidemic supervision. Anti-tuberculosis dispensaries are organizational and methodical centers for examination of risk groups.

Table 3 - Symptom complexes requiring mandatory examination for tuberculosis

Bronchopulmonary symptoms	**Symptoms of intoxication that continue more than 2 weeks**
Cough is dry or with expectoration more than 2 weeks	Febrile, subfebrile temperature
The bilobed cell, which is connected with breathing	Weight loss, loss of appetite, increased sweating
Hemoptysis, pulmonary bleeding	Weakness

Table 4 — Categories of the population with an increased risk of tuberculosis

Contacts with patients for tuberculosis	**Social risk groups**	**Medical risk groups**
Family and household	The person is undefined placesresidence	Patientization professionallung diseases
Professional	Migrants, refugees, displaced persons	Patients with diabetes
Nosocomial	Alcoholics, drug addicts, unemployed	Patients who are constantly taking systemic glucocorticoids,cytostatics
Penitentiaries,SIZO	Persons who are orgot rid of penitentiaries institutions	HIV-infected

If changes are detected on the X-ray fluorogram, the patient is sent for a three-time examination of sputum for KSP.

Primary diagnosis (detection) of tuberculosis upon application to institutions of the general hospital network (ZLM) by the method of smear microscopy and X-ray fluorography

It is carried out in three stages:

1. Collection of complaints and history.
2. X-ray examination of chest organs.
3. Three-time study of sputum for acid-resistant bacteria (ACB).

ComplaintsIn the presence of complaints of suspicion of tuberculosis (there is a cough for 3 weeks or more, with sputum discharge, which is accompanied by loss of body weight; fatigue; fever; night sweats; pain in the chest; loss of appetite; hemoptysis) the patient is sent for an X-ray fluorographic examination in 2- x projections (direct and lateral). If any changes are detected on the x-ray/fluorogram, the patient is sent for a three-time examination of sputum for KSB. If X-ray fluorographic examination is not available, a patient with symptoms suspicious for tuberculosis is sent for a three-time examination of sputum for KSB.

Anamnesis.A careful anamnesis of the disease is of great importance, because tuberculosis has a gradual onset. Even with an acute manifestation of the disease (febrile temperature, hemoptysis and pulmonary hemorrhage), it is possible to establish that a few weeks (months) before this manifestation, the patient felt weakness, sweating, decreased appetite, lost body weight. In addition, it is necessary to establish the presence of tuberculosis in the patient's history or members of his family and contacts with tuberculosis patients. It is necessary to establish the social status of the patient to determine the risk group. It is important to establish the presence of somatic diseases that are risk factors for tuberculosis: diabetes, HIV infection, diseases that require constant use of glucocorticosteroids or cytostatics.

Physical examination. There are no specific clinical and physical signs for tuberculosis — pallor, reduced nutrition, and limited mobility of one half of the chest are typical. In a significant number of patients with tuberculosis, the physical status does not differ from the norm. Auscultation can detect vesicular, weak, increased (bronchial, amphoric) breathing, absence of respiratory sounds (pleurisy, caseous pneumonia), large-vesicular wet rales, dry rales, which is very nonspecific. Percussion - clear lung tone, dulling of lung tone, tympanitis (large cavern), dullness (exudative pleurisy).

Clinical blood analysis. Hemogram changes usually reflect the presence of an active inflammatory process (leukocytosis, rod-nuclear shift, lymphopenia, monocytosis, increased ESR), they are also highly variable and may be absent in patients with a limited pulmonary process.

Three options for tactical actions for institutions of the general medical network in the detection of tuberculosis:

1. If acid-fast bacteria (AFB) are detected in at least 1 sputum analysis and there are X-ray changes in the lungs, the patient is referred to an anti-tuberculosis institution for further examination to confirm the diagnosis of tuberculosis.
2. If CSB is not detected in any of the 3 examined sputum smears, and infiltrative or focal changes in the lungs are determined radiologically, a test therapy with broad-spectrum antibiotics lasting up to 2 weeks is carried out. At the same time, drugs with antituberculosis activity (streptomycin, kanamycin, amikacin, capreomycin, rifampicin, mycobutin, drugs of the fluoroquinolone group) cannot be used. If there is no effect from the therapy with broad-spectrum antibacterial drugs, the patient should be referred for additional examination to an anti-tuberculosis institution.
3. If CSB is not detected in any of the 3 examined sputum smears, but radiologically in the lungs, dissemination, a rounded formation, a cavity, an increase in intrathoracic lymph nodes, pleurisy are determined, the patient should be referred for further examination, which includes instrumental diagnostics for the purpose of morphological, cytological and microbiological verification of the diagnosis, in an anti-tuberculosis institution.

Table 5 - List of examinations used to diagnose pulmonary tuberculosis

Mandatory examinations	**Additional examinations (only anti-tuberculosis institutions of level 3)**
Collection of complaints and history	Computed tomography of the chest cells
3-fold analysis by the sputum method microscopies by Ziel-Nielsen (urazi negative result in ZLM)	Fibrobronchoscopy with lavage sampling waters for microscopic and cultural research
Chromatic analysis of sputum methodsowing on Levenstein-Jensen medium	Transthoracic or transbronchial or open puncture lung biopsy, biopsy of enlarged lymph nodes
Test for sensitivity to antituberculosis drugs of the first line. The test for sensitivity to second-line antituberculosis drugs is performed only in casedetection of resistance to first-line antituberculosis drugs	Thoracoscopy with biopsy of the pleura for sampling of exudate for microscopic and cultural examination
Inspection and echocardiography OGP(if these studies were not performed in ZLM). Tomography of the affected parts of the lungs	Accelerated cultural methods MBT detection: BACTEK
	Genetic laboratory methods: tests amplification of nucleic acids (PCR)
	Experimental anti-tuberculosis chemotherapy
	Tuberculin diagnostics (Mantoux test)
	Serological tests for tuberculosis

The diagnosis of tuberculosis is made on the basis of:

- a positive result of microscopy of a sputum smear or biopsy material (when changes are detected during X-ray or bronchological examination);
- a positive cultural study of sputum or biopsy material (if changes are detected during X-ray or bronchological examination);
- a positive result of a morphological examination for tuberculosis of biopsies of affected organs or tissues;
- x-ray changes in the lungs, which are confirmed by anamnestic and clinical data;
- data of genetic methods of determination of mycobacterium tuberculosis, which are confirmed by X-ray, anamnestic, clinical data;
- positive results of serological tests or tuberculin diagnostics, if they are confirmed by radiological, anamnestic, clinical data;
- a positive response to attempted antituberculosis treatment, if it is confirmed by X-ray, anamnestic, and clinical data.

Organizational work in the fight against tuberculosis is carried out by specialized anti-tuberculosis institutions and, under their leadership, all treatment and prevention institutions of health care authorities.

The anti-tuberculosis dispensary occupies a central place in the system of organizing anti-tuberculosis measures. Translated from English, "to dispense" means to distribute. Institutions of this type first appeared in Western Europe (1887, Scotland, Edinburgh, doctor Robert Philippe, 1911, France, Lille, doctor Albert Calmette), although dispensary-type clinics existed in these cities even earlier. In Russia, dispensaries appeared at the beginning of the 20th century (in Odessa in

1912, doctor M.I. Kranzfeld).

There are two types of dispensary anti-tuberculosis facilities: an anti-tuberculosis dispensary (district, city, regional, republican) and a dispensary department or office in the Central Hospital, polyclinic, medical and sanitary unit.

Anti-tuberculosis dispensary is a closed type medical institution to which patients are referred by doctors of treatment and prevention facilities in the dispensary's service area.

The anti-tuberculosis dispensary serves the population of a certain district, where dispensary work is carried out by the district phthisiologist. The mode of observation of patients, treatment tactics, preventive and rehabilitation measures in anti-tuberculosis dispensaries correspond to the grouping of contingents of persons subject to supervision.

Work on the timely detection of tuberculosis would be devoid of common sense, if the cases of untimely detection, or in a neglected state, were not subjected to careful study, establishing the reasons that led to this. Three groups of reasons are considered: the fault of the patient who is inattentive to his health, the fault of the medical worker who did not fulfill his duties to involve the patient in the examination, as well as the peculiarity of the course of the tuberculosis process. The answer to this question is given as a result of a discussion at a joint meeting of district specialists - phthisiologists and therapists chaired by senior specialists. Annually, the results of the work of each treatment and preventive institution of the general network on issues of timely detection of tuberculosis are summed up, and organizational conclusions are made.

Distribution of the contingent of tube dispensaries into dispensary accounting categories.

Group and categories	Definitions of categories	Deadlines for treatment of patients and observation in these categories
Category 1	Newly diagnosed tuberculosis of various localizations with bacteremia (VDTB MBT+), as well as other (severe and widespread) forms of the disease of various localizations without bacterial isolation (VDTB MBT -).	2 years
Category 2	Relapses of tuberculosis different localizations with bacterial release (RTB MBT +) and without bacterial release (RTB MBT -) and newly diagnosed tuberculosis of various localizations were ineffectively treated with bactericide (VDTB NL MBT+) and without bactericide (VDTB NL MBT -).	2 years
Category 3	Newly diagnosed tuberculosis of various localizations with a limited process without bacterial isolation (VDTBO MBT -), tuberculosis intoxication in children (TI) and tuberculosis of the intrathoracic lymph nodes or primary tuberculosis complex in the calcification phase while maintaining the activity of the process.	2 years
Category 4	Chronic tuberculosis of various localizations with bacterial isolation and without bacterial isolation (XTB MBT+ and KhTB MBT-)	No time limit
Category 5	Risk groups for tuberculosis and its recurrence	
Group 5.1	Residual changes after cure tuberculosis different localizations	Persons with small residual changes - 3 years, with a capital - 10 years, with

		big with scaly foci, tuberculomas, with a diameter of more than 4 cm, cirrhosis - lifelong. Children andteenagers behind redundantchange fee after- hay bales meningitis - up to 18 year old
Group 5.2	Contacts - persons who are in contact with bacteriostatic agents (for children and adolescents, also with patients with active tuberculosis) or with agricultural animals suffering from tuberculosis.	Observing-sia forof all contact with bacteriostatic agents, as well as 1 yearpost withdrawal bacterial isolationsometimes Epid.registration, his death or departure.
Group 5.3	Adults with tuberculous changes in the respiratory organs of undetermined activity, who are not registered in an anti-tuberculosis facility	3 months
Group 5.4	Children infected with tuberculosis mycobacteria from risk groups (tuberculin test deviation, hyperergic reaction to tuberculin, increase in tuberculin sensitivity by 6 mm per year, as well as children with concomitant pathology) Children with post-vaccination complications of BCG. Children who were not vaccinated with BCG during the newborn period.	With a favorable flow of tubes. infection 1 year. With the preservation of hyperergic reactions to tuberculin, as well as those infected with chronic foci of a non-specific infection - 2 years. 1 year Observed until the no vaccination.

Group 5.5	Children and adolescents in whom it is necessary to clarify the etiology of sensitivity to tuberculin (post-vaccination or infectious allergy), or the nature of changes in the lungs and other organs with for the purpose of differential diagnosis. Children and adolescents with tuberculous changes in the organs of the respiratory system are not defined	Up to 6 months

	activity	

A question of self-control

1. What categories of the population are risk groups for tuberculosis? 2. State the signs of tuberculosis.
3. What symptom complexes require mandatory examination for tuberculosis? 4.
What are the criteria for diagnosing tuberculosis?
5.What is the scope of examinations used to diagnose pulmonary tuberculosis?
6. What are the categories of dispensary supervision?
7. Give the characteristics of tuberculins.
8. What is the Mantoux test technique?
19. Dates evaluation of the result of the Mantoux test with 2 TO according to qualitative and quantitative indicators.

Indicative tasks for processing theoretical material

Orientation map regarding the student's independent work with literature on the subject of the lesson.

No	Main tasks	Instructions	Answers
1.	**Learn:** Population categories fromincreased risk of disease tuberculosis.	Make a list of grou risk on tuberculosis ps	
2.	What are the symptom complexes requiremandatory examination on tuberculosis.	Specify bronchopulmonary andintoxication symptoms, lasting more than 2 weeks.	
3.	Criteria for the diagnosis of tuberculosis.	Signs of tuberculosis Laboratory test data Result of previous treatment	
4.	Primary diagnosis (detection) tuberculosis	Specify three stages	
5.	Options for tactical actions for institutions of the general medical network in the detection of tuberculosis:	Specify three options	
6.	List of examinations that are used for diagnosis of pulmonary tuberculosis	Specify mandatory and additional examination	
7.	Categories of dispensary supervision	Specify categories dispensarysupervision, give characteristic of each category	

2.Practical works (tasks) to be performed

1. Collect history (especially epi-history) and establish risk factors for tuberculosis.
2. Collect complaints and identify signs that are characteristic of tuberculosis.
3. Conduct an objective examination of a patient suspected of tuberculosis (examination, palpation, percussion, auscultation).
4. Draw up an individual scheme for further examination of the patient (select the mandatory diagnostic minimum, additional and optional methods of examination).
5. Divide the contingent of patients according to the categories of dispensary supervision
6. Tuberculin diagnostics as a special method of detecting and diagnosing tuberculosis.

3.Test tasks for self-control

1.The patient was diagnosed with tuberculosis 2 years ago. With the diagnosis: Disseminated tuberculosis of the lungs, the phase of infiltration and decay, MBT (+) was treated for 7 months in the tube. hospital, discharged from

effect He was under the supervision of the phthisiologist of the district anti-tuberculosis dispensary. He took prophylactic chemotherapy courses irregularly, abused alcohol. An exacerbation of the process has now been detected. To which category of dispensary supervision should this patient be assigned?
+A.1
B.2
P.3
D.4
E. 5

2.The patient has been suffering from fibro-cavernous tuberculosis of the lungs for 7 years. It is under the supervision of the district anti-tuberculosis dispensary in category 4. What are the deadlines for treatment and observation of patients in this category?
+A. Not limited by time
B. 2 years
S. 3 years
D. 4 years
E. 10 years

3. Patients suffering from diabetes, CKD, peptic ulcer disease of the stomach and duodenum, alcoholism are a risk group for tuberculosis. How often should they undergo preventive FG examinations?
+A. 1 time a year
B. 2 times a year
C. 1 time in 2 years D. 1 time in 3 years E. 1 time in 4 years

4.The child was not BCG vaccinated during the newborn period. In which dispensary registration group should she be observed before vaccination?
A.1
B. 2.
P. 3.
D. 4.
+E.5.

5. A 20-year-old patient was treated for 6 months in a tuberculosis hospital with the diagnosis: Miliary tuberculosis of the lungs, infiltration phase, MBT (-). What category of dispensary supervision does this patient belong to?
+A.1
B.2
P.3
D.4
E. 5

6.Patient K., 38 years old, was undergoing inpatient treatment for infiltrative pulmonary tuberculosis in the decay phase, MBT (+). In which category of dispensary supervision will this patient be observed after discharge from the hospital?
+A.1
B.2
P.3
D.4

E. 5

7. Patients suffering from diabetes, CKD, peptic ulcer disease of the stomach and duodenum, alcoholism are a risk group for tuberculosis. How often should they undergo preventive FG examinations?
+A. 1 time a year
B. 2 times a year
C. 1 time in 2 years D. 1 time in 3 years
E. 1 time in 5 years

8.The child has a tuberculin test curve. After the examination, it was found that the child is healthy. In which group of dispensary records should it be observed?
A.1
B. 2.
P. 3.
D. 4.
+E.5.

4. Discussion of theoretical issues:

Note. The discussion of theoretical issues can take place in the form of answers to the questions posed, debates, discussions, presentations with reports, abstracts, discussion of reports and abstracts, review of the answers of students of higher education, etc.

4.Individual tasks for students of higher education on the topic
Topics of reports/abstracts:
- the current state of dispensary supervision in Ukraine
- clinical signs of pulmonary tuberculosis
- clinical signs of pulmonary tuberculosis
- the history of tuberculin tests

5.List of recommended literature (main, additional, electronic information resources):

Main:

1. Phthysiatry: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others] ; under the editorship V. I. Petrenko. Kyiv: Medicine, 2018. 471p.
2. Current issues of phthisiology: manual / D. G. Kryzhanoskyi, V. A. Freiwald, N. A. Marchenko (and others). Dnipropetrovsk: T.K. Serednyak, 2017. 155p.
3. Phthisiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. Kharkiv: KhNMU, 2016. 176 p.

Additional:

1. Prevention of tuberculosis. Study guide for students and interns of VNMZ IV accreditation level and doctors / V. I. Petrenko, M. G. Dolynska, A. V. Aleksandrin, V. V. Petrenko. Kyiv: 2 Print, 2017. 88 p. URL:http://tb.ucdc.gov.ua/uploads/files/prophilaktica.pdf.
2. Biochemical Value Dynamics in Patients with Multidrug-Resistant Tuberculosis/HIV with CD4+ Lymphocyte Cells below 50 Cells/μCLandits Variability in the Application of Adjuvant Immunoglobulin Therapy / NA Matsegora, AV Kaprosh, PB Antonenko // International Journal of Mycobacteriology. 2019; 8 (4):374 - 380. (SCOPUS)
3. Global tuberculosis report 2019 (WHO/CDS/TB/2019.15). Geneva, World Health Organization. 2019 URL: https://apps.who.int/iris/bitstream/handle/10665/329368/

9789241565714-eng.pdf
4. Order of the Ministry of Health of Ukraine No. 530 dated 25.02.2020 "Health care standards for tuberculosis". URL: https://phc.org.ua/sites/default/files/users/user90/Nakaz_MOZ_vid_ 25.02.202 0_530_Standarty_medopomogy_pry_TB.pdf
5. UBERCULOSIS Clinical guideline of the Ministry of Health of Ukraine, based on evidence No. KH 2021-530 dated 11/17/2021.URL: https://www.dec.gov.ua/mtd/tuberkuloz/
6. Order of the Ministry of Health of Ukraine No. 287 dated February 1, 2019 "On the approval of the Infection Control Standard for health care institutions that provide assistance to tuberculosis patients." URL: https://zakon.rada.gov.ua/laws/show/z0408-19#Text

Electronic information resources

1. Website of the Public Health Center of the Ministry of Health of Ukraine.http://phc.org.ua/
2. Tuberculosis issues on the WHO website.http://www.who.int/tb/en/
3. National Tuberculosis Resource Center.http://tb.ucdc.gov.ua/
4. www.dec.gov.ua/mtd/dodatki/2016_729_VGC/2016_729_YKPMD_VGC.doc
5. http://www.ifp.kiev.ua/doc/people/tubzar.htm

Topic 3

General clinical methods of diagnosis of tuberculosis. Special diagnostic methods (laboratory, x-ray). Clinical analysis of patients.

Goal. To acquaint students with higher education with general clinical and special methods of diagnosing tuberculosis.

Basic concepts:to know the scheme of examination of a patient with tuberculosis; features of epidanamnesis; the patient's complaints and identify signs that are characteristic of tuberculosis; objective examination of a patient with tuberculosis (examination, palpation, percussion, auscultation); to determine changes in general clinical tests of blood and urine of a patient with tuberculosis; to explain the methods of bacterioscopic and bacteriological examination of sputum.

Plan

1. Theoretical questions:

A significant number of methods were proposed for the diagnosis of tuberculosis during the 19th and 20th centuries. Pathological anatomy, microbiology, immunology, genetics, molecular biology, physics and mathematics added their achievements to the rich clinical experience. Today, the doctor uses an extremely wide range of methods for diagnosing tuberculosis, which differ significantly in their sensitivity and specificity.

All diagnostic methods can be divided into two main groups. The first, common to all diseases, includes methods that are based on the determination of changes in the body characteristic of a given disease. In the case of tuberculosis, the direct methods of this group are morphological (histological diagnosis of changes in tissues) and radiation (radiological diagnosis of changes in organs) methods. Indirect classic methods are a direct examination of the patient (anamnesis and physical examination), laboratory studies (clinical, biochemical, immunological, and others), methods of functional diagnostics.

The second group of diagnostic methods, which are used only for infectious diseases, consists of methods aimed at finding and identifying the causative agent of the disease. These can be either direct methods: material microscopy, selection of a culture of microorganisms, molecular diagnostics, or indirect methods that allow detecting the presence of the pathogen in the body: tuberculin diagnostics, detection of M. tuberculosis antigens, specific anti-tuberculosis antibodies.

Clinical methods. The first were methods based on obtaining data on disease manifestations. The art of collecting anamnesis and direct examination of the patient, brought to perfection by the work of many generations of doctors, made it possible to form the very concept of phthisis as a long-term debilitating disease with predominant damage to the respiratory organs.

The anamnesis of the disease begins with the clarification of the patient's complaints. The variety of manifestations of tuberculosis depends on the phase and spread of the process, as well as on the localization of specific changes in the lungs. The onset of the disease in tuberculosis is more often gradual and rarely acute.

The earliest and most frequent complaints of tuberculosis patients are weakness, rapid fatigue and reduced work capacity. In addition, the patient often notices the presence of increased body temperature, night sweats, sleep disturbances and deterioration of appetite and weight loss. The cause of these phenomena is tuberculosis intoxication, which occurs as a result of the vital activity of mycobacterium tuberculosis, as well as the products of protein breakdown in the affected organ.

An increase in body temperature is especially diverse. In most patients with pulmonary tuberculosis, in the initial period of the disease, it is normal, or subfebrile for several weeks. In the case of progression of the process or its acute onset, the body temperature rises to 380 - 390 C. Only in cases of miliary tuberculosis, acute pleurisy, the body temperature sometimes reaches 400 C. The temperature curve has an irregular character: mostly, the body temperature rises briefly in the evening, and then normalizes. Less often, the patient's elevated temperature can last the whole day and decrease only after sleep. Patients often do not feel elevated body temperature, they continue to work as usual.

Local manifestations of the disease are associated with damage to the respiratory system: cough, shortness of breath, expectoration, chest pain, hemoptysis.

Cough is the most common symptom in patients with pulmonary tuberculosis, from a mild cough at the beginning of the disease to a significant spread of the lesion in the lungs. The patient does not pay attention to coughing or associates it with smoking or a cold. Paroxysmal dry cough can be a manifestation of tuberculosis of the intrathoracic lymph nodes or tuberculous endobronchitis.

With limited processes in the lungs, sputum may not be released or it may be very little. With the appearance of destruction, the amount of sputum increases and in chronic forms can reach 100-200 ml per day. It is mucoid or muco-purulent in nature, almost never has an unpleasant smell.

Hemoptysis and bleeding usually complicate destructive forms of tuberculosis. Their cause may be: increased permeability of blood vessels caused by the toxic effect of microorganisms and tissue decay products; rupture or erosion of blood vessels in the area of lung tissue destruction; high blood pressure in the bronchial arteries; disorders in the blood coagulation system, activation of fibrinolysis. Hemoptysis and bleeding are most often observed with pronounced morphological changes in the lungs, as well as in cases of basal sclerosis of the lungs and bronchiectasis. With hemoptysis and pulmonary bleeding, the blood is bright red, foamy (see "Complications of pulmonary tuberculosis").

Shortness of breath is not characteristic of the initial manifestations of tuberculosis and appears only during physical exertion. It can be observed as an early symptom only in miliary tuberculosis and tuberculous pleurisy. Shortness of breath is determined by the prevalence of the process and the development of pulmonary heart failure, is a symptom of spontaneous pneumothorax and atelectasis.

Chest pain is caused by the transition of the process to the pleura, intensifies during deep breathing, coughing. The pain has a stabbing character and is usually not intense. Dull or aching pain in the chest occurs in chronic processes and is caused by shrinkage of the lungs and narrowing of the chest. Acute, sudden pain occurs with spontaneous pneumothorax.

In the anamnesis of the disease, first of all, we find out the duration and features of its course. In most cases, tuberculosis begins gradually, that is, with a slow increase in malaise, the appearance of subfebrile body temperature, cough, and weight loss. Tuberculosis can begin imperceptibly for the patient (unaperceptively). Sometimes the onset of the disease can be acute, as a rule, with miliary tuberculosis and caseous pneumonia.

Clinical manifestations of tuberculosis are characterized by extreme polymorphism, the forms of the course and localization options of the process are so diverse that they can resemble other diseases, the so-called "masks" of tuberculosis (influenza, pneumonia, bronchitis, typhoid fever, rheumatism, whooping cough, etc.).

When interviewing the patient, it is necessary to find out the epidemiological anamnesis (contact with a tuberculosis patient, especially family). In addition, information about past illnesses (frequent pneumonia, pleurisy, etc.), accompanying illnesses that increase the risk of endogenous reactivation of tuberculosis (diabetes, gastric and duodenal ulcers, alcoholism, HIV infection, mental illnesses, chronic obstructive pulmonary disease) are also important. recent pregnancy, childbirth. It is important to work in harmful conditions, excessive smoking, unfavorable sanitary and household living conditions.

It is important to find out the date and results of the previous fluorographic examination in adults, and for children - information about BCG vaccination, results of tuberculin diagnostics. The task of clinical examination is to identify not only bright, but also subtle symptoms of the disease. In other words, the search for microsymptomatics is underway. And quite often, this kind of research allows you to identify certain symptoms that can be used to clarify the diagnosis.

An external examination involves the detection of manifestations of tuberculous intoxication. In some patients, there is a shine in the eyes, a blush on the cheeks against the background of pale facial skin. Persistent, red dermographism is noted, red spots (Troussot spots) may appear on the skin of the neck and front of the chest. These manifestations develop as a result of irritation of the sympathetic nervous system.

At the beginning of the disease, the examination of the patient does not reveal any visible deviations from the norm. During the chronic course of tuberculosis, characteristic changes in appearance are formed due to the duration of tuberculosis intoxication, morphological changes in the lungs, the development of complications, the so-called habitus phthisicus (see the topic "Fibrous-cavernous tuberculosis"). Paraspecific manifestations of a toxic-allergic nature (erythema nodosa, keratoconjunctivitis, phlykten) are found in children with tuberculosis.

During the examination, the symmetry and participation of both halves of the chest in breathing, the prominence of the supraclavicular and subclavian fossae are compared. With significant cirrhotic changes, the chest is deformed (its corresponding half narrows), so the affected side lags behind during breathing.

Palpation determines skin turgor and moisture, muscle tone, and the thickness of the subcutaneous fat layer. In children, micropolyadenitis is detected (an increase in peripheral lymph nodes is greater than in 5 groups). Over areas of infiltration or cirrhosis, the voice tremor is increased, and in case of exudative pleurisy, pneumothorax, it is weakened. Palpation of the upper edge of the trapezius muscle causes a feeling of pain (Potenjer-Vorobyov symptom). During palpation of the abdomen, the size of the liver and spleen is determined, an increase in mesenteric lymph nodes is possible.

Percussion is performed according to the generally accepted method: first comparative, then topographic. Over a healthy lung, the percussion sound is clear pulmonary, which is caused by its elasticity and airiness.

A box percussion sound is determined over areas of compensatory emphysema (more often in the lower parts of the lungs). A tympanic sound occurs during percussion over large caverns, the diameter of which is more than 4 cm, over a tense spontaneous pneumothorax. If the lung tissue around the cavity is compacted due to the development of fibrosis in it or there are massive infiltrative changes above the cavity, a shortening of the percussion tone can be determined. A shortened and dull percussion sound is determined over the areas of reduced

pneumatization of lung tissue with infiltrates, focal-fibrous changes, as well as with atelectasis over an airless lung, in cases of exudative pleurisy. It should be borne in mind that with widespread disseminated forms of the lungs or limited infiltrates, areas of compaction alternate with areas that are well filled with air, so it is difficult to detect changes in the percussion sound.

Topographic percussion allows you to determine the limits of the lungs: the upper or standing height of the apices, their width (the width of the Krenig fields), the size and location of the mediastinum, as well as the localization and size of the pathological process in the lungs.

In most cases, pathological changes in secondary forms of tuberculosis are localized in the upper parts of the lungs. With a long process, the tops shrivel due to their replacement by fibrous tissue, therefore, their standing height above the collarbones may be lower than normal (3-4 cm). At the same time, the width of the Krenig fields, which are determined by percussion of the upper edge of the trapezius muscle, also decreases.

By percussively determining the lower limit of the lungs and exhalation, it is possible to measure the active excursion of the lungs and diaphragm.

Auscultation is performed sequentially over symmetrical areas of the lungs. The patient should breathe calmly and deeply through a half-open mouth and, at the request of the doctor, cough quietly at the end of exhalation. Attention is paid to the type of breathing (vesicular, bronchial, hard) and additional noises (wet or dry wheezing, crepitation). Auscultation should be performed especially carefully in the supraclavicular and subclavian areas, taking into account the frequent localization of the tubercular process in the upper parts of the lungs. Listening to changed breathing and wet wheezing in the so-called "alarm zones" (above the upper corner of the scapula, as well as under the collarbone), as a rule, indicates the presence of a destructive process. In addition to the tops of the lungs, the areas located in the 4th intercostal space in front, in the 2nd, 5th, 6th intercostal spaces of the axillary area, behind near the lower corner of the scapula, and in the paravertebral area at the level of the middle of the scapula are carefully listened to.

Over areas of emphysema, with exudative pleurisy, thickened pleura, and a developed subcutaneous fat layer, weak breathing is heard. Increased breathing is heard in cases of infiltrative process in the lungs. With the development of fibrotic changes in the lungs, breathing becomes difficult. Above the large caverns, which have a fibrous capsule and a connection with the bronchus, you can listen to bronchial or amphoric breathing. Wet rales of various caliber are heard over the pathologically changed lung over areas of caseous necrosis and perifocal inflammation. Dry wheezes are more often heard when the bronchi are damaged and in areas of fibrosis. In case of fibrinous pleurisy, during auscultation, the noise of friction of pleural sheets is determined.

In most patients with pulmonary tuberculosis, the borders of the heart are within the normal range, but in acute or chronic forms of tuberculosis, the borders of the heart may increase, during auscultation, the splitting of the second tone, sometimes the first tone, the accent of the second tone over the pulmonary trunk, a faint systolic murmur and tachycardia are heard. that is, signs of hypertension in the small circle of blood circulation and chronic pulmonary heart disease. The pulse is accelerated, labile.

With extrapulmonary forms of tuberculosis, along with the general symptoms caused by tuberculosis intoxication, patients also have local manifestations of the disease on the side of the affected organ.

Laboratory methods.

Identification of the causative agent. Detection of MBT in various pathological material from patients is of crucial importance for the diagnosis of tuberculosis infection. The detection of the causative agent of tuberculosis is the main and indisputable criterion that indicates the specific nature of the disease.

Traditional methods of detecting MBT in pathological material are bacterioscopic, bacteriological and biological methods. In addition to sputum, objects of research at the MBT

there may also be urine, feces, cerebrospinal fluid, exudate from cavities, pus, secretions from wounds, biopsies of various tissues.

The diagnostic significance of laboratory methods is determined by the quality of the biological material delivered for analysis. WHO has adopted uniform rules for taking biological fluids for the study of the causative agent of tuberculosis. The main requirements are three times taking the material from the patient before the start of specific therapy, compliance with the rules of delivery and processing of the material before the study.

One of the main methods of detecting MBT is bacterioscopic. The essence of the method is the ability of mycobacteria, which are stained with fuchsin, to retain the dye after long-term decolorization in hydrochloric acid alcohol. In many countries, it is widely used not only for diagnosis, but also for the detection of tuberculosis patients during mass surveys of the population.

During direct bacterioscopy, the preparation is stained according to the Ziel-Nielsen method. To do this, prepare a thin smear on a glass slide, then dry it at room temperature and fix it over the flame of an alcohol still. A strip of filter paper is placed on the fixed preparation, which is filled with Zil's carbolic fuchsin. The smear is heated over a flame until steam appears (2-3 times). Next, the filter paper is removed, the drug is washed with distilled water, immersed in a solution of hydrochloric acid alcohol or a 5% solution of sulfuric acid for 3 minutes. At the same time, all bacteria and morphological elements of sputum, except mycobacterium tuberculosis, are discolored. After that, the drug is thoroughly washed with water and stained with a 0.5-1% solution of methylene blue for 1-2 minutes. Then the drug is washed with water, dried in air. Stained preparations are microscoped with an immersion system. MBTs are colored red, and the surrounding background and non-acid-fast microorganisms are colored blue.

In order to detect MBT in the preparation by the bacterioscopic method, it is necessary that 1 ml of sputum contains at least 100,000 microbial bodies. With a smaller number of mycobacteria, the test may give a false negative result.

The ability of the bacterioscopic method to detect MBT increases by 14 - 20% when using fluorescent microscopy. For coloring the drug, fluorochromes are used - organic dyes that fluoresce when illuminated with ultraviolet, violet or blue rays. Such dyes are auramine 00, rhodamine C. A sputum smear is stained with a mixture of 0.05 g of auramine and 1000 ml of distilled water, heated slightly, washed with water, decolorized with 3% hydrochloric acid alcohol, washed again and methylene blue is applied for 1-2 minutes. The drug is examined with the help of a fluorescent microscope. MBTs glow golden-yellow on a dark background.

Flotation and sedimentation methods are used to increase the number of MBT in a unit of the studied volume of sputum.

Modern clinics use the flotation method. The method is based on the fact that when two liquids with different relative densities are shaken, the lighter liquid floats to the top together with mycobacterium tuberculosis in suspension.

For research using the flotation method, 10 - 15 ml of sputum is placed in a flask with a capacity of 200 - 250 ml, add 2-3 ml of 0.5% alkali solution and shake for 10-15 minutes until the sputum becomes homogeneous. To achieve complete homogenization, the sputum flask is heated for 20–30 min in a water bath at a temperature of 560 C. Next, about 100 ml of distilled water and 0.5 ml of xylene or benzene are poured into the flask and shaken again for 10 min. After that, distilled water is added to the neck of the bottle and left to stand at room temperature for about 30 minutes. A creamy foam floats on the surface of the liquid, which is sucked off with a pipette and applied to a glass slide. The layer of foam on the slide is dried and a new layer of foam from the flask is applied. This is how the foam is layered 5

– 6 times, after which the smear is fixed and stained according to Ziel-Nielsen.

The bacteriological method of detecting MBT consists in inoculating sputum on nutrient media. Before sowing, sputum is processed to suppress growth

non-specific microflora. The standard nutrient medium for growing MBT is Levenstein–Jensen solid egg medium. In recent years, egg medium II, proposed by E.R. Finn, has been widely used. There are also semi-liquid and liquid nutrient media. Culture growth takes place within 14-90 days. 20-100 microbial cells in 1 ml of sputum are enough to isolate the MBT culture. In the presence of mycobacteria detected by the culture method, the sensitivity of MBT to chemotherapy must be determined. Popescu's medium, which contains KNO3, is used for rapid establishment of drug resistance. Sensitivity to chemopreparations can be determined both to individual drugs and to their combinations.

Often, MBTs determined by bacterioscopy do not grow on nutrient media due to the loss of the ability to reproduce under the influence of chemotherapy drugs.

The sensitivity of the above-mentioned methods in the diagnosis of extrapulmonary forms of tuberculosis is noticeably reduced. In recent decades, bacteriological methods have been used in the developed countries of the worldsignificantly improved by the companies "OrganonTeknika" and "BectonDickinson" (USA)

proposed automatic analyzers of bacteriological cultures "MB/Bact", "BACTEC 960", which use liquid selective nutrient media. The method is based on the registration of CO2, which is released by viable mycobacteria. These analyzers allow you to get a positive result of the analysis for pathogenic mycobacteria on the 12th day, and a negative result on the 21st day. However, the high cost of the equipment makes it inaccessible to most medical facilities. In our country, this method was not widely used. The biological method consists in infection with the sputum of guinea pigs, which have a high sensitivity to MBT. This method is widely usedapplied

diagnostics since the discovery of the causative agent of this infection. It has not lost its value even now. Moreover, this method is now successfully used in the laboratories of scientific research institutes to detect not only typical unchanged, but also various biologically modified forms of the pathogen, in particular L-transformed and filter forms. In addition, this method is the main one in determining the species belonging to MBT, their virulence, studying the pathogenicity of atypical cultures.

Before infecting a guinea pig, sputum is treated with sulfuric acid to destroy non-specific microflora and centrifuged. Sediment in an isotonic solution of sodium chloride is injected subcutaneously into the inguinal area, intraperitoneally, or into the testicle. About a month after infection, the lymph nodes in mumps increase and generalized tuberculosis develops.

Among the traditional methods of detecting MBT and diagnosing tuberculosis, the biological method was considered the most sensitive until recently, because tuberculosis in guinea pigs can be caused by the introduction of sputum containing less than 5 microbial bodies in 1 ml. Today, the possibility of loss of MBT virulence has been proven. Such mycobacteria are viable, can grow on nutrient media, but do not cause disease in experimental animals. Therefore, it is necessary to use different methods of microbiological research to detect MBT in pathological material.

Among the new methods of detecting MBT or their antigenic structures in pathological material, new highly sensitive methods - molecular genetic methods and enzyme immunoassay - deserve attention.

Among the molecular genetic methods for the diagnosis of tuberculosis, the method of DNA probing and polymerase chain reaction (PCR) is most often used. These methods are based on the principle of complementarity of nucleotide bases in the construction of a double-helix DNA molecule. When carrying out DNA probing, in the case of the presence of a specific section of DNA of mycobacteria in the examined sample, a hybrid (double-stranded fragment) of the examined DNA and the DNA probe is formed.

Blood test. Usually, pronounced changes are not detected in the blood of tuberculosis patients. Hypochromic anemia is observed only in patients with a widespread process and severe intoxication or with repeated pulmonary bleeding. Changes in the number of leukocytes and

of the leukocyte formula of the blood occur mainly in acute processes and decay of lung tissue. Can be observed: moderate leukocytosis, shift of the leukocyte formula to the left, lymphopenia, monocytosis. ESR increases during an active tuberculosis process.

Biochemical methods make it possible to assess the state of humoral regulation systems and individual links of metabolic processes, the functional state of endocrine and parenchymal organs. Biochemical studies are carried out in different periods of monitoring patients and have different tasks.

To assess the presence and severity of the inflammatory process, it is advisable to include the determination of the amount of haptoglobin, ceruloplasmin, and C-reactive protein in the minimum set of studies. In order to detect the hidden reactivity of the tubercular process, a tuberculin protein test is performed. In the presence of hidden activity under the influence of tuberculin, the inflammation in the foci "comes to life", which is reflected in an increase in the amount of the alpha2-globulin fraction; the test is considered positive when alpha2-globulins increase by more than 10% from the initial level. Since in recent years there has been a tendency to increase the frequency of the combination of tuberculosis and diabetes, it is necessary to determine the glucose content in the blood of all patients who come to the hospital.

Urine examination. In patients with pulmonary tuberculosis, urine analysis usually does not provide significant diagnostic information, but sometimes reveals serious complications of the underlying disease (for example, kidney amyloidosis). With tuberculosis of the kidneys, protein, leukocytes, and often erythrocytes, as well as MBT, are detected in the urine.

Examination of urine for MBT is carried out in those cases when at least 15 leukocytes are detected in each field of view during the examination of the sediment. To detect MBT, urine is repeatedly centrifuged, layering each time new portions from the urine sediment on a glass slide. The smear is stained according to the Ziel-Nielsen method. At the same time, decolorization of the drug should be carried out in 3% hydrochloric acid alcohol, since acid-resistant saprophytes (smegma microorganisms) are often found in urine, which are discolored in alcohol. The absence of MBT in purulent urine does not deny the presence of kidney tuberculosis. In such cases, the urine is examined bacteriologically or using molecular genetic methods.

X-ray examination of the chest organs (FG, X-ray of the chest organs, X-ray tomography, computer tomography of the affected areas of the lungs). Tuberculosis does not have a specific X-ray picture either by the nature of the X-ray changes or by localization. In recent years, in addition to upper lobe localization, lower lobe localization is common. With a long course of tuberculosis, the X-ray picture can also be supplemented with signs of pneumofibrosis, emphysema, and bronchiectasis. Important for diagnosis is the presence of residual changes of transferred tuberculosis: calcified foci in the lungs or intrathoracic lymph nodes. An analysis of the x-ray fluorography archive can provide great help in the correct treatment of the disease, the search for which should not be neglected. In the presence of focal, infiltrative, destructive changes, rounded formations, regardless of localization, pleural effusion, asymmetric enlargement of the lung roots, tuberculosis should be suspected and the following patient management tactics should be followed. X-ray diagnosis of tuberculosis is the recognition of the disease using X-rays. X-rays (X-rays) are short-wave electromagnetic radiation from 0.0001 to 450 Aº (1 Aº - 10 m). When describing an X-ray picture, you should use algorithms (sequence of signs): localization: by segments, lobes, relative to ribs, clavicle, diaphragm, cortical zone, basal zone, paratracheal, etc.; number of shadows: single, solitary, multiple; shape: oval, round, triangular, shapeless shadows or foci, etc.; size in diameter - foci, and foci - small, medium, large, or polymorphic (different); contours - blurred, limited, clear, fuzzy, jagged, etc. Qualitative features: intensity: low, medium, high; pattern: mesh, reinforced, deformed.

In tuberculosis, the main radiological syndromes are distinguished: shadowing, illumination, focal shadow (up to 1 cm in diameter), focal dissemination, ring-shaped shadow (cavernous), rounded shadow or spherical shadow (tuberculoma), deformation of the lung root.

Tuberculin diagnosis. At present, there is no doubt that the state of immunological reactivity largely determines the course of many diseases. The term "Immunological reactivity" often has a different meaning, but most authors understand the state of the body's defense forces, the ability of the body to protect itself from infectious and non-infectious pathogenic environmental factors.

During the last 40-50 years, there was an idea of immunity as immunity to an infectious agent (from the Latin immunitas - exemption from duties)

- microorganisms and their toxins.

R.V. Petrov considers immunity as a means of protecting the body from living bodies and substances that carry signs of genetically alien information. Therefore, immunity is protection against the foreign, that is, the ability to recognize the foreign in order to preserve the homeostasis of the body.

The tuberculin reaction is referred to the phenomenon of hypersensitivity of the delayed type (HST), because it begins to manifest no earlier than 6 hours after the introduction of tuberculin. The decisive factor of an allergic reaction can be microbial antibodies (BCG test) and tuberculin. Tuberculin diagnostics is based on the determination of tuberculin allergy - the increased sensitivity of a person to tuberculin, which occurs as a result of infection with virulent tuberculosis mycobacteria or BCG vaccination. The tuberculosis or vaccine process is accompanied by increased sensitivity to tuberculin, which is especially clearly manifested on the skin at the place of its introduction in the form of positive tuberculin reactions.

The use of tuberculin samples for the purpose of diagnosis and differential diagnosis, determination of infection and primary infection with tuberculosis, as well as selection of persons for BCG revaccination, has found wide application in practice.

The basis of the development of the tuberculin reaction is the interaction of tuberculin and antibodies fixed on T lymphocytes.

The "antigen-antibody" complex activates lymphocytes that secrete lymphokines. The latter cause damage to the cells of the macroorganism with the release of biologically active substances, which cause the development of an infiltrate in the skin. Pathomorphologically, the tuberculin reaction is characterized in the first 24 hours by tissue swelling at the site of tuberculin injection, and later (72 hours) by a mononuclear reaction with a larger number of histiocytes. In case of hyperergic reactions with the presence of tissue necrosis, even elements of specific inflammation - epithelioid cells - are found in the cellular composition.

Tuberculin was first obtained by the prominent German scientist R. Koch in 1890. This tuberculin was called Koch's old tuberculin or ATK (ALT Tuberculinum Koch). This is a filtrate from a 6-8-week culture of mycobacteria of human and bovine tuberculosis, which grew on meat in peptonoglycerine broth, sterilized with running steam for 1 hour and thickened to 1/10 of the volume at a temperature of 90. An isotonic solution is used as a preservative sodium chloride with 0.25% carbolic acid. Chemically, tuberculin consists of protein, polysaccharide, lipoid fractions, nucleic acids of mycobacteria, as well as peptones of the broth on which mycobacteria grew. Peptones can cause non-specific reactions. Tuberculin belongs to the class of haptens. The main requirements for tuberculin are specificity and standardization of its activity. The specifically active beginning of ATK is only 1% of the entire mixture, the last 99% are inert substances. A more specific preparation is dry tuberculin PPD-L (PPD-L), (S), (Protein Purified Derivative) purified from the proteins of the environment. This type of drug was first obtained in 1934 in the USA under the name RRD

-5. In 1940, Seibert and Lillen produced a large series of purified tuberculin PPD-5, which in 1952 was approved by the World Health Organization as an international

standard for dry purified tuberculin. In the USSR in 1939, dry purified tuberculin was obtained by M.O. Linnikova at the Leningrad Institute of Vaccines and Serums. In 1954, this institute began mass production of the drug PPD-L.

In the former Soviet Union, the standard tuberculin is standardized in relation to the international one, taking into account the intensifying tween - 80, in contrast to the tuberculin produced by the Copenhagen Institute of Vaccines and Serums, PPD-HT-23 by order of the WHO, which is widely used by all countries of the world.

PPD-L with an indication of its activity in international tuberculin units "TO" with the addition of 0.005% tween-80 as a stabilizer, 0.01% quinozol solution as a preservative is a transparent colorless liquid, which is made by diluting the powder in a standardizing solvent.

In 1954, the WHO approved the international unit (TO) for PPD-L (1 TO contains 0.00002 mg of the pure drug and 0.000008 mg of buffer salts as impurities). In the USSR, in 1963, the national standard of purified tuberculin with an international activity unit of 0.00006 mg was approved.

The use of ready solutions of tuberculin in ampoules is important for the uniformity and accuracy of tuberculin diagnostics. In 1965, purified tuberculin was obtained in the USSR in a solution standardized in relation to the international standard.

The international unit (IU) is the amount of tuberculin that can be administered without fear of very strong reactions in the research contingent, and which is able to detect 80-90% of positive reactions in spontaneously infected persons with tuberculosis. The shelf life of the drug is 12 months at a storage temperature of 0 to 4 C.

The above shows that tuberculin diagnostics is a biological test based on the specific ability of tuberculin to cause in the body of animals and humans sensitized by mycobacterium tuberculosis inflammatory-allergic reactions of a delayed type, which are quantitatively and qualitatively manifested individually.

With tuberculosis infection, the following allergic reactions are recognized: hyperergy - increased reaction to tuberculin; normergy - a moderate reaction to tuberculin; hypoergy - weak reaction and anergy - lack of reaction. Anergy is positive when the infected organism has a higher immunological reactivity. As a result, previously positive tuberculin samples become negative. And negative, when previously positive tuberculin tests turn negative due to a sharp decrease in immunity (meningitis, miliary tuberculosis).

The intensity of tuberculin reactions depends on many factors. These include the virulence and massiveness of the infection, the degree of natural resistance, the functional state of the neuro-endocrine system, household conditions, etc.

Mass tuberculin diagnostics. Dlyamasova tuberculin diagnostics are used intradermal Mantoux test with 2 TO PPD- L. Vona is carried out: for the timely detection of tuberculosis patients; to identify persons infected with tuberculosis mycobacteria with an increased risk of the disease (primary infection with hyperglycemic reactions to tuberculin); for the selection of contingents to be revaccinated with the BCG vaccine. Mass tuberculin diagnosis is carried out in the following sequence:

1. Selection of contingents for examination taking into account contraindications. 2. Preparation of tools.
3. Technical execution of the test. 4. Evaluation of Mantoux test results.
5. Implementation of therapeutic and preventive measures based on the conducted research.

In organized teams, mass tuberculin diagnosis is carried out by a special team (a doctor and 2 nurses), the formation of which is entrusted to polyclinics. In order to exclude the influence of seasonal and other factors on sensitivity to tuberculin, tuberculin diagnostics should be carried out at the same time of the year, preferably in autumn. In cases where the tuberculin test should be carried out 3-4 weeks after the appointment

Schick's tests, administration of gamma globulin, 4-6 weeks after an acute infectious disease.
Practically healthy children who have no contraindications, starting from 1 year of age and up to 14 years of age (depending on the epidemic situation in the region), are subject to annual examination for the purpose of early detection of tuberculosis. Contraindications to performing a tuberculin Mantoux test are acute infectious diseases, chronic infectious and allergic diseases (rheumatism, bronchial asthma), idiosyncrasy, skin diseases, epilepsy.

72 hours after setting the sample, measure the transverse diameter of the infiltrate relative to the axis of the hand using a transparent ruler.

The reaction is evaluated by quantitative and qualitative indicators. Quantitative assessment is characterized by the size of the infiltrate in millimeters, qualitative - by the color of the infiltrate, the presence of vesicles, lymphangitis, necrosis, daughter rashes. According to the quantitative assessment of samples, reactions are distinguished:

- negative - there are no other manifestations at the site of tuberculin injection, except for the reaction from the injection;
- doubtful - hyperemia of any size, or an infiltrate up to 4 mm in size;
- positive - an infiltrate with a diameter of 5 mm or more.

A hyperergic reaction is considered: in children and adolescents, the size of the infiltrate is 17 mm or more; in adults - 21 mm or more, as well as any size of the infiltrate, but with the presence of vesicles - necrotic reactions, lymphangitis, daughter rashes. When evaluating tuberculin reactions, factors affecting its intensity should be taken into account. Decreased sensitivity to tuberculin is noted in measles, whooping cough, scarlet fever, malaria, cancer, lymphogranulomatosis, sarcoidosis, and myxedema. Increase - with bronchial asthma, rheumatism, base disease, flu, with exacerbation of chronic diseases.
Post-vaccination allergy usually develops in the first year after vaccination (BCG revaccination). Most children and adolescents have a positive Mantoux reaction with an infiltrate of 5-11 mm. The infiltrate in these cases is flat, does not rise above the skin, is vaguely defined, fades quickly, and does not leave a pigment spot. There are no clinical manifestations of intoxication symptoms. A characteristic tendency to weaken the Mantoux reaction a year or more after vaccination. An indication in the anamnesis of contact with a tuberculosis patient is an important circumstance that confirms infection. For a much later period of the appearance of a positive Mantoux test, its more pronounced character (infiltrate 11 mm in diameter with the presence of clinical signs of the disease) is more indicative of the growth of the primary infection. It should be remembered that in the absence of a trace of BCG vaccination or a scar size of 1-2 mm, the post-vaccination allergy in most children is very weak and quickly fades away. If difficulties arise in differential diagnosis, such children should be taken under the supervision of a dispensary.

Questions for self-control

1. To review the methods of diagnosis of tuberculosis.
2. What data in the anamnesis of a patient with tuberculosis should be paid attention to?
3. What changes are detected during an objective examination of a patient with tuberculosis7
4. What two symptom complexes are found in patients with tuberculosis?
5. What methods of examining sputum for the presence of MBT do you know? 6. To describe the bacterioscopic method of determining KSP.
7 To describe the bacteriological method of detecting MBT.
8. Give the characteristics of tuberculins.
9. What is the Mantoux test technique?
10. To evaluate the result of the Mantoux test with 2 TO according to qualitative and quantitative indicators.
11. How to differentiate post-vaccination and infectious allergies?
12. What causes the lung pattern on the X-ray?
13. What X-ray signs are characteristic of tuberculosis of the respiratory organs?

14. What methods of X-ray examination are mandatory for the diagnosis of tuberculosis?

Indicative tasks for processing theoretical material.

Orientation map for independent work with literature

No	Main tasks	Instructions	Answers
1.	**Know:** Peculiarities of anamnesis the patient on tuberculosis.	Indicate what parts the anamnesis of a tuberculosis patient consists of and what features are inherent in each of them parts	
2.	Complaining patient onpulmonary tuberculosis	Specify which complaints refer toeach two-symptomatic complexes of pulmonary tuberculosis.	
3.	Features of the object tive examination tuberculosis patient	Specify methods objectiveexamination of the patient and what changes are found	
4.	X-ray diagnostics tuberculosis	Indicate methods of X-ray examination of a patient with tuberculosis.	
5.	X-ray semiotics of tuberculosis	Indicate the main radiological signs that appear on radiographs of patients with various forms of pulmonary tuberculosis.	
6.	Microbiologicaldi agnosis of tuberculosis	Specify the methods of microbiological diagnosis of tuberculosis. Name modern bacterioscopic methods sputum research.	
7.	Microscopic diagnosis of tuberculosis according to the Tsil method Nielsen	Specify the stages of smear staining according to the Ziel-Nielsen method. Sensitivity of the method.	
8.	Technical installations intradermal Mantoux test with 2 TO.	Specify the stages of setting the Mantoux test with 2 TO.	
9.	Evaluation of the result Mantoux tests with 2 TO	Specify a positive result, doubtful and negative reaction	

2.Practical work (tasks) to be performed Mastering practical skills:

1. Explain the importance of bacterioscopic and bacteriological methods of sputum research.
2. To evaluate the Mantoux test with 2 TO PPD-L on the basis of the local reaction.
3. Plan the examination scheme of a tuberculosis patient and analyze the data obtained.
4. Diagnose tuberculosis of the respiratory organs on the basis of the patient's history, clinical, laboratory and X-ray examination and formulate a clinical diagnosis according to the classification.

3.Test tasks for self-control:

1. In kindergarten, the time has come to carry out scheduled tuberculin diagnostics. Which tuberculin should be used?

A. Koch's tuberculin

B. Dry purified tuberculin B.

Tuberculin on an ointment base

G. PPD-L in a standard dilution with an activity of 2 TO in 0.1 ml

D. PPD-L in a standard dilution with an activity of 100 TO in 0.1 ml

2. In the fall, high school students undergo routine tuberculin diagnostics. How is tuberculin administered during the Mantoux test?

A. Intradermal B. Skin
V. Roughly
G Internally ulcerated
D. Subcutaneously

3. An infiltrate with a diameter of 18 mm was detected in a 6-year-old child during a Mantoux test with 2 TO. A year before, the result of the Mantoux reaction was a papule of 10 mm. Determine the nature of sensitivity to tuberculin.

A. Hyperergic.B.
Hypoergic. S.
Normergichna.
D. Anergic.
E. Post-vaccination reaction.

4. The child is vaccinated in the maternity hospital. Has a post-vaccination scar measuring 5 mm. In the first year of life, Mantoux test with 2 TO – papule 10 mm, in the second – 6 mm. How do you determine the reaction to tuberculin in this case?

A. Viraj
B. Non-specific disease C. Post-vaccination.
D. Primary tuberculosis. E.
Allergic

5. In the patient, during the fluorographic examination according to the FG plan, an area of inhomogeneous darkening was found under the clavicle on the right. What additional x-ray examination of the lungs should be performed?

A. Overview X-ray B.
Lateral X-ray
B. Roentgenogram D.
Roentgenoscopy
D. Target X-ray

6.The doctor received the result of a blood test from a tuberculosis patient. What hemogram indicators are characteristic of this disease?

A. Leukopenia, lymphocytosis, eosinopenia.
B. Leukocytosis, lymphopenia,
monocytosis.
B. Monocytopenia, leukopenia, lymphopenia.
G. Leukocytosis, lymphocytosis, eosinopenia.
D. Leukocytosis, monocytosis, lymphocytosis.

7.. The patient passed a sputum analysis for the presence of CSP. What amount of CSP should be in 1 ml of sputum so that it can be detected by bacterioscopy?

A. 10 – 100
B. 200 - 1000
V. 1000 - 2000
G. 500 - 1000
D. 50,000 - 100,000

8. The kindergarten nurse takes into account the result of the Mantoux test with 2 TO. The sample is considered hyperergic if the diameter of the infiltrate is:

A. 10 mm or more
B. 12 mm or more
C. 15 mm or more
D. 17 mm or more
D. 5 mm or more

9.The child is 5 years old, in the kindergarten a scheduled Mantoux test with 2 TO was carried out. After 72 hours, the test result is taken into account. What size papule is the minimum positive result of the Mantoux test with 2TO?

A.3 mm
B.17 mm
H.5 mm
D.10 mm
D.21 mm

10. A Mantoux test with 2 TO revealed an infiltrate measuring 18 mm in a 6-year-old child. Evaluate the Mantoux test.

A. Hyperergic
B. Negative
S. Post-vaccine allergy D.
Moderate
E. Positive

11.In a 4-year-old child, during the next Mantoux test with 2 TO, after 72 hours, an infiltrate with a diameter of 5 mm is determined at the site of tuberculin injection. Evaluate the test results.

A. Anergic B.
Positive C.
Hyperergic D.
Doubtful
E. Negative

12.The young man is 20 years old, lives in the center of tuberculosis infection. During the examination, a tuberculin Mantoux test was performed with 2 TO, defined as hyperergic. What is the significance of a hyperergic test in a young man?

A. Hyperemia 12
mm B. Papule 15
mm C. Hyperemia
24 mm D. Papule 4
mm
E. Papule 6 mm, necrosis

4.Individual tasks for students of higher education on the topic

Topics of reports/abstracts:
- modern laboratory methods of diagnosis of tuberculosis
- modern instrumental methods of diagnosis of tuberculosis
-differential diagnosis of Mantoux test and gamma interferon release test.

5.List of recommended literature (main, additional, electronic information resources):

Main:

1. Phthysiatry: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others] ; under the editorship V. I. Petrenko. Kyiv: Medicine, 2018. 471p.
2. Current issues of phthisiology: manual / D. G. Kryzhanoskyi, V. A. Freiwald, N. A. Marchenko (and others). Dnipropetrovsk: T.K. Serednyak, 2017. 155p.
3. Phthisiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. Kharkiv: KhNMU, 2016. 176 p.

Additional:

1. Prevention of tuberculosis. Study guide for students and interns of VNMZ IV accreditation level and doctors / V. I. Petrenko, M. G. Dolynska, A. V. Aleksandrin, V. V. Petrenko. Kyiv: 2 Print, 2017. 88 p. URL:http://tb.ucdc.gov.ua/uploads/files/prophilaktica.pdf.
2. Global tuberculosis report 2019 (WHO/CDS/TB/2019.15). Geneva, World HealthOrganization. 2019 URL:https://apps.who.int/iris/bitstream/handle/10665/329368/ 9789241565714-eng.pdf
3. Order of the Ministry of Health of Ukraine No. 530 dated February 25, 2020 "Health care standards for tuberculosis". URL: https://phc.org.ua/sites/default/files/users/user90/Nakaz_MO Z_vid_25.02.2020_530_Standarty_medopomogy_pry_TB.pdf
4. TUBERCULOSIS Evidence-based clinical guideline of the Ministry of Health of Ukrainedata No. KH2021-530 dated 11/17/2021. URL: https://www.dec.gov.ua/mtd/tuberkuloz/
5. Order of the Ministry of Health of Ukraine No. 287 dated 01.02.2019 "On approval of the Infection Control Standard for health care institutions that providehelp for tuberculosis patients". URL: https://zakon.rada.gov.ua/laws/show/z0408-19#Text

Electronic information resources

1. Website of the Public Health Center of the Ministry of Health of Ukraine.http://phc.org.ua/
2. Tuberculosis issues on the WHO website.http://www.who.int/tb/en/
3. National Tuberculosis Resource Center.http://tb.ucdc.gov.ua/
4. www.dec.gov.ua/mtd/dodatki/2016_729_VGC/2016_729_YKPMD_VGC.doc
5. http://www.ifp.kiev.ua/doc/people/tubzar.htm

Topic 4

General principles of treatment. Antimycobacterial drugs. Treatment of tuberculosis of the mucous membrane of the oral cavity and jaw bones. Side effects of antituberculosis drugs. Clinical analysis of patients.

Goal.

Get acquainted with the general principles of treatment of tuberculosis patients and the basics of antimycobacterial therapy, taking into account its side effects.

Basic concepts:general principles of treatment of tuberculosis patients; familiarize yourself with the general principles of chemotherapy, modern WHO recommendations for the treatment of tuberculosis; familiarize yourself with the contribution of domestic scientists, the developments of the department's employees in the treatment of tuberculosis patients; be able to explain to the patient the need for timely and long-term treatment of tuberculosis.

Plan

1. Theoretical questions:

In order to achieve a clinical and anatomical cure, it is necessary to apply a complex of methods and at the same time it is important to follow the basic principles of treatment in order to use them in the most rational way. The main principles of treatment of a patient with tuberculosis are as follows:

1. Treatment of the patient should be comprehensive and begin as early as possible. Complex treatment involves the use of a combination of various methods necessary to achieve a cure. The complex of treatment methods includes, first of all, chemotherapy

– the main method of treatment of patients with tuberculosis. In second place are pathogenetic medicinal methods, which are used with the aim of normalizing the disturbed functions of the macroorganism: reducing the severity of inflammatory reactions, stimulating healing processes, eliminating metabolic disorders. The complex of tuberculosis treatment methods also includes collapsotherapy in the form of therapeutic pneumothorax and pneumoperitoneum. Recently, collapsotherapy is used very rarely and in a relatively limited group of patients. Only in those cases where there is every reason to believe that chemotherapy will be ineffective: in case of drug resistance, allergy to chemotherapy drugs, it is used as an adjunct to chemotherapy. The last group of methods in complex therapy consists of surgical interventions performed according to the relevant indicators.

2.Treatment of a patient with tuberculosis must be long-term and continuous. Until now, it has not been possible to develop such methods that would allow to achieve treatment in a short period of time. With successful treatment, a tuberculosis patient recovers, on average, 1-2 years after the start of therapy. Some patients are cured earlier, especially with limited, small forms of tuberculosis. But there are patients with widespread, destructive forms of tuberculosis who need to be treated for 2-3 years before recovery occurs. There is a clear connection between the degree of neglect of the tuberculosis process and the duration of treatment: the more advanced the tuberculosis process, the longer the treatment should be. Clinical recovery is a stable healing of the tubercular process, which is confirmed by differentiated observation periods. These terms are established taking into account two main parameters: the amount of residual changes and the presence of serious concomitant diseases.

3.The treatment should be staged with controlled chemotherapy, i.e. the administration of drugs is carried out under the supervision of medical personnel. Each stage of treatment corresponds to an individual program, and at all stages - in a hospital, sanatorium and dispensary - it must be carried out according to a defined plan with respect for continuity. Sanatorium-climatic treatment is the second stage in the treatment of patientstuberculosis and is used to restore impaired body functions and restore working capacity (rehabilitation) of patients. The final stage of therapy is dispensary. This is where the continuous main course of therapy ends. Its total duration for patients with small forms is at least 9 months, and with destructive tuberculosis and bacterial excretion - at least 12 months. Controlled anti-relapse treatment, which is most often carried out in the spring and autumn for 2-3 months, is of great importance in the prevention of tuberculosis reactivations. in outpatient or sanatorium conditions.**Drug therapy.** Treatment of patients with tuberculosis depends from 2 interrelated factors: suppression of the mycobacterial population with the help of anti-tuberculosis drugs and regression of tuberculous changes in the affected organs and reparative processes in them. Since tuberculosis is an infectious disease, the mainthe method of treatment is antimycobacterial chemotherapy. Therapeutic effect conditioned direct bactericidal or bacteriostatic effect antituberculosis drugs on mycobacterium tuberculosis and their death. Regression of tuberculous changes in the affected organs and reparative processes in them also take place with the help of anti-tuberculosis drugs, which cause the death of the causative agent of the disease, which causes damage to organs and tissues, as well as with the help of pathogenetic drugs,

which affect inflammation, regeneration processes or improve the tolerability of antituberculosis chemotherapy.

Antituberculosis chemotherapy

The main principles of antituberculosis chemotherapy are:

- Chemotherapy is the main component of the treatment of tuberculosis and consists in the use of anti-tuberculosis drugs;
- chemotherapy is the combined use of antituberculosis drugs (at least 3), to which MBT are sensitive and which are taken for a long time (at least 6 months); at the same time, the daily dose of each drug, in individual cases, should be administered in one dose. The combination of drugs taken per day is called the daily dose of chemotherapy;
- chemotherapy is carried out under the direct supervision of medical personnel taking anti-tuberculosis drugs.

According to the classification of the International Anti-tuberculosis Union (1975), all anti-tuberculosis drugs are divided into 3 groups:
group A - the most effective drugs - isoniazid, rifampicin, mycobutin; group B - drugs of medium effectiveness - streptomycin, ethambutol, pyrazinamide, morphazinamide, kanamycin, ethionamide, prothionamide, cycloserine, viomycin (florimycin); group C - drugs of low efficiency - PASK sodium, thioacetazone (Tibon).

Group B drugs include capreomycin and ofloxacin (ciprofloxacin).

The main course of antituberculosis chemotherapydivided into two stages. The first stage (or the first phase) is intensive treatment. It is carried out to stop the reproduction of tuberculosis mycobacteria and significantly reduce the bacterial population in the patient's body. The therapy carried out eliminates acute manifestations of the disease, stops bacterial excretion and, in most patients, leads to the healing of cavities in the lungs. The phase of intensive therapy can be part of the preparation for surgical treatment.

The second stage of treatment (or the second phase) is supportive therapy,which is conducted to consolidate the achieved results. The goal of the second stage of treatment is to ensure a stable clinical effect and prevent exacerbation of the process.

The method of treatment of patients with respiratory tuberculosis depends on the morphological changes in the lungs and the detection of MBT in sputum. In patients with a destructive process and bacterial excretion, it is more intense compared to tuberculosis patients without bacterial excretion and destructive changes in the lungs. Antituberculosis drugs

Today, there are 2 classifications of antituberculosis drugs: according to indications for their appointment (I and II series) and according to antimycobacterial activity.

First-line antituberculosis drugs (isoniazid, rifampicin, streptomycin, ethambutol, pyrazinamide) are prescribed to patients with newly detected tuberculosis and relapses of the disease, which secrete sensitive Mycobacterium tuberculosis (MBT) (patients of categories I - III). Second-line antituberculosis drugs include kanamycin, amikacin, ofloxacin (ciprofloxacin), ethionamide (protionamide), PASK, cycloserine, capreomycin, and thioacetazone. According to the existing standards of treatment, they are used only in individualized chemotherapy schemes for patients with tuberculosis of the IV category, in which the drug resistance of MBT to PTP of the I line is determined, as well as in patients of other categories with resistance of the MBT to drugs of the I line or their poor tolerability. The distribution of anti-tuberculosis drugs into first- and second-line drugs ensures compliance with standard tuberculosis chemotherapy schemes to prevent the development of drug resistance of MBT. By activity, antituberculosis drugs are divided into 3 groups: the most effective (isoniazid, rifampicin), moderately effective (streptomycin, kanamycin, amikacin, ethambutol, pyrazinamide, ofloxacin, ciprofloxacin, ethionamide, protionamide capreomycin, cycloserine), less effective (PASK, thioacetazone).

Table 1 - Main anti-tuberculosis drugs and recommended doses*

Drugs	Recommended doses in mg/kg	
	Daily	Three times a week
Isoniazid (H)	5 (4-6)	10 (8 - 12)
Rifampicin (R)	10 (8 - 12)	10 (8 - 12)
Pyrazinamide (P)	25 (20 - 30)	35 (30 - 40)
Streptomycin (S)	15 (12 - 18)	15 (12 - 18)
Ethambutol (E)	15 (15 - 20)	30 (20 - 35)
Rifapentine (Rp)**	–	–

***Note*: *** All anti-tuberculosis drugs should be taken once a day, approximately 30 minutes before meals (rifampicin before meals).

** Rifapentin (long-acting drug) is taken at a dose of 10 mg/kg (0.45-0.6 g) at a single dose in the intensive phase 2 times a week, in the maintenance phase - 1 time a week.

Modes of chemotherapy. Treatment is carried out by:

- conducting a standardized controlled short-term regime of antimycobacterial therapy for patients of categories 1, 2, 3 under the direct supervision of a medical worker;

-prescribing a five-component standardized controlled regime of antimycobacterial therapy to patients with severe forms of tuberculosis.

The choice of the appropriate regimen of chemotherapy depends on the results of the bacterioscopic examination before the start of treatment, the previous course of anti-tuberculosis therapy and the degree of severity of the disease.

Table 2 - Categories and regimens of treatment

Treatment category		Initial phase (in general) a	Phase about-extension (daily, or intermittently)a
1	**4-component mode**is prescribed to patients with newly diagnosed pulmonary tuberculosis with bacteremia with mild forms, without bacterial excretion with a widespread process, with mild forms of extrapulmonary tuberculosis.	2 HRZE or 2 HRZS	4 HR or 4 H_3R_3
	5-component modeprescribed to patients with severe widespread forms (the process goes beyond the limits of 1 fate) of destructive pulmonary tuberculosis with large (4 cm or more) or numerous (3 or more) destructions regardless of size, caseous pneumonia; as well as severe forms of tuberculosis with signs of generalization (involvement of several organs/systems in the tuberculosis process; miliary forms).	2HRZES 1HRZE	3HRE2HR or 3 HRZ 2 HR
2 (cases of repeated treatment tuberculosis: "Relapse", "Treatment after breaks","Treatment after failure", "Other")		2HRZES1 HRZE	5 HRE or $5H_3R_3E_3$
3(prescribed to patients with new cases of limited pulmonary tuberculosis with a negative sputum smear; as well as limited forms extrapulmonary tuberculosis).		2 HRZE	4 HR or 4 H_3R_3

4(patients with chronic tuberculosis - "treatment failure" after a repeated course or patients who were excluded from category I, II, III due to MBT resistance).	Treatment conductac cording to the results of the drug sensitivity test or under the DOTS plus program.

a Treatment that includes rifampicin requires drug monitoring. If

it is impossible to ensure control over the ingestion of rifampicin, the drug is not prescribed in the maintenance phase. Instead of rifampicin, ethambutol is prescribed, the duration of the maintenance phase is extended to 6 months - 6NE. To ensure controlled intake of rifampicin in patients who live far from controlled treatment offices, rifampicin is replaced by rifapentine, which has a prolonged effect and allows visiting the controlled treatment office 2 or 1 times a week. At the same time, the patient is given isoniazid on his hands for self-administration every day, except for office visit days, when the patient will take all the medication under the supervision of a medical professional.

Prescribing streptomycin instead of ethambutol should be based on data on the prevalence of streptomycin resistance in a given region.

The initial phase lasts at least 2 months, and during this period the patient must take at least 60 daily doses of antimycobacterial drugs. If how many doses are missed, the treatment in the intensive phase continues until the patient receives all 60 doses in the 1st phase (or 90 doses in the case of a 5-component regimen). By the end of the initial phase, the sputum smear becomes negative in most patients. In this case, proceed to the continuation phase. If the sputum smear results are still positive in category I patients after two months of treatment (with an intensive regimen of 4 drugs) or three months of treatment in category II patients, it is necessary to extend the intensive phase of treatment for one more month, and then start the maintenance phase. If bacterial isolation is determined at the beginning of 5 months, the case is registered as a treatment failure and the patient is re-registered under the 2nd clinical category and a second course is prescribed. In cases where MBT resistance to anti-tuberculosis drugs has been determined since the start of treatment, and the sputum smear remains positive, or the sputum smear is negative and confirmation of the cessation of bacterial excretion by cultural research is not received, the patient is registered in his category as transferred, and re-registered in category 4 for treatment according to DOTS plus program.

Patients of the 1st category should necessarily undergo standardized treatment in hospital conditions until the bacterial excretion stops. In an outpatient setting or sanatorium, antimycobacterial therapy is continued in order to complete the main course of treatment that was started in the hospital. The volume of the standard course of treatment does not depend on the place of its implementation (hospital, sanatorium, outpatient clinic) and it must be fully completed.

Patients of the 2nd category with MBT sensitive to antimycobacterial drugs or without defined resistance are prescribed standard antibacterial therapy lasting at least 8 months. If, according to the results of the sensitivity test, MBT multiresistance is determined, the patient is registered in his category as transferred, and re-registered in category 4 for treatment under the DOTS plus program.

For the treatment of patients of the 3rd category, a standard regimen is used, the duration of which is 6 months. If the smear and culture studies are negative both at the beginning and during the course of chemotherapy, treatment is carried out on an outpatient basis. If a positive culture result is obtained from the beginning of treatment, then a sputum smear test is performed (2 samples). In the case of a negative result of the smear, treatment is continued within this category until the end of the main course of chemotherapy. If at least 1 smear is positive, the patient is registered in this category as treatment failure and transferred to category 2.

In patients of the 4th category with sensitive MBT, the treatment is carried out similarly to the contingent with relapsed pulmonary tuberculosis, but for a longer period - up to 10–12

months Patients with MBT resistant to antituberculosis drugs are prescribed treatment regimens according to DOTS plus.

The daily dose of all antimycobacterial drugs is prescribed in one dose according to the treatment regimen.

Failure to comply with this requirement will be allowed only after a consultation consisting of at least three specialists (the chief physician or deputy chief physician for medical work, the head of the department, the attending physician) and the presence of substantiated evidence of poor tolerance of the prescribed chemotherapy regimen, which is prescribed fractionally throughout the day.

When treating a patient with tuberculosis, a nurse must observe the following:

1.Be present when the patient uses antimycobacterial drugs and make sure that the patient has swallowed the drugs and washed them down with water.

2.Immediately after the patient has taken daily doses of drugs, the nurse, in the presence of the patient, must make a note in the "Medical card for the treatment of tuberculosis patients (TB 01)" about taking the drugs.

*3.*It is strictly forbidden to distribute drugs to all patients, and then make notes about their use in the "Medical card for the treatment of a patient with tuberculosis (TB 01)".

Treatment of extrapulmonary forms of TB (PLTB). Practically all extrapulmonary forms of TB can be treated with the same treatment regimens as for pulmonary ones. Various non-severe forms of extrapulmonary TB should be treated according to standard treatment regimens for pulmonary forms of TB with a negative sputum smear (Category III). Severe forms of extrapulmonary TB are registered in category I. For patients with extrapulmonary TB, the usual form of evaluation of the effectiveness of treatment is clinical supervision.

Tuberculosis of the oral cavity occurs as a complication of other forms of primary and secondary tuberculosis of the lungs and intrathoracic lymph nodes. Treatment of such patients consists in prescribing antituberculosis drugs in generally accepted doses. Some of them should be used for rinsing.

Treatment criteria. The criteria for curing tuberculosis are:

– the main course of chemotherapy has been completed and fully completed.

– absence or disappearance of clinical and laboratory signs of tuberculous inflammation;

– permanent cessation of bacterial release, which is confirmed by microscopic and cultural examination of the material;

– healing of caverns in the lungs and resorption (or compaction) of infiltration and foci; the absence of radiological signs of tuberculosis of the lungs or other organs as a result of the completion of its involution, which is reflected by the cessation of the process of resorption of tubercular changes in the lungs, pleura, or other organs.

- restoration of functional capabilities and performance.

Side effects of antituberculosis drugs. Most TB patients complete treatment without any significant adverse drug reactions. However, some patients may experience them.

Under normal circumstances, routine laboratory monitoring is not required, if the patients did not have liver diseases before the start of treatment and it was functioning normally.

To risk groups that may experience side effectson anti-tuberculosis drugs, and in which periodic clinical control and laboratory tests (AlA, bilirubin) should be carried out, include:

- elderly people;
- malnourished patients;
- pregnant women or those who are breastfeeding;
- alcoholics;
- patients with chronic kidney or liver failure;
- HIV-infected;

- patients with disseminated and neglected TB;
- patients with allergic diseases, with anemia;
- patients with diabetes;
- patients with a family history of adverse reactions,
- patients receiving TB therapy irregularly;
- patients who, along with TB drugs, take other drugs.

Patients with severe adverse reactions should be treated in a hospital.

There are three types of adverse reactions to antimycobacterial drugs: allergic, toxic (possible mixed toxic-allergic) reactions and dysbacteriosis.

Table 4 - Side effects from first-line antituberculosis drugs

Prepar e	Adverse reactions		Methods of registration of side effects	Methods of correction
	FREQUENT	*LIQUID*		
H		Dizziness, chief pain, euphoria, disturbance sleep, paresthesias, peripheral neuritis, psychosis, palpitations, dysfunction liver, hepatitis, allergic reactions (eosinophilia, dermatitis).	reviews poll the patient biochemical research blood general blood test, review neuropathologist	Expressed reactions withdrawal of the drug or replacement with ftivazide or flurenizide Appointment detoxification therapy, vitamin therapy (primarily vitamin B6), hepatoprotectors, dose reduction isoniazid, transitional intermittent reception.
R		Dyspeptic phenomena (pain stomach, nausea, vomiting, loss of appetite), hepatotoxic reactions (in including medicinal fever), acute renal insufficiency, myalgia, arthralgia, hematological violation, anaphylactic reactions.	reviews poll the patient biochemical blood test, general blood test.	Stop receiving at the time of anaphylaxis shock, acute renal failure deficiencies Temporarily stop receptionprehepatitis, hematological reactions. Hepatotropic therapy hepatotoxic reactions, hepatitis. Antihistamine therapy with allergic reactions.
Z	Dyspeptic phenomena (nausea, anorexia, vomit), reddened skin	Hepatitis, arthralgia, allergic reactions (dermatitis, eosinophilia)	Review and poll the patient biochemical research blood general	Expressed reactions drug withdrawal Appointment detoxification therapy, antihistamines drugs, hepato- toprotectors

			blood test.	Dose reduction pyrazinamide, intermittent reception.
E		Retrobulbar neuritis, deterioration of acuity vision, hemorrhage retina, dizziness, headache, paresthesias,	reviews poll the patient Review optometrist, neuropathologist	to stop reception, reduce dose, apply intermittently appoint vitamins

		dyspeptic phenomena, difficulty in sputum production, increase its viscosity.		group B, expectorants, proteolytic enzymes.
S	Noise and ringing ears deterioration of hearing	Nephrotoxicity, shaky gait, dizziness, nystagmus, instability Romberg's pose increase arterial pressure.	Review and survey-treatment of the patient, audiometric control and control functions vestibular apparatus, analysis urine	Withdrawal of the drug (full-time or part-time). dose reduction, intermittent reception Appointment antihistamines drugs, vitamin therapy (vit. B 1, vitamin B6), pantothenate calcium, ATP.

Table 5 - Symptomatic approach to side effects of antituberculosis drugs

A side effect	Medicines, what causethis reaction	Treatment
1	2	3
Light		***Continue taking TB drugs, you can reduce the dose***
Anorexia, vomiting, pain instomach	Z, R	Medicines are taken in small amounts the amount of food the night before. Symptomatic treatment
Pain in the limbs	Z	Aspirin
Peripheral neuropathy	H	Pyridoxine (B6) 50-100 mg/day
Urine is red	R	This is the norm
Severe		***Discontinuation of the drug that causes an adverse reaction***
Itching, rash on the skin	S, H, R, Z	Cancellation of taking TB drugs
Hearing loss	S	Cancellation of reception S, appoint E
Dizziness (nystagmus,unsteady gait)	S	Cancellation of reception S, appoint E
Jaundice (others reasonsexcluded), hepatitis	H, Z, R	Alternating TB drugs andchecking the level of transaminases and bilirubin
Visual impairment (other reasons are excluded)	E	Cancellation of ethambutol
Shock, purpura, acute renal failure	R	Discontinuation of rifampicin

Management of patients with skin adverse reactions. If the patient has itchy skin and there is no other reason for it, try symptomatic treatment with antihistamines and continue treatment. However, if a rash appears on the skin, it is necessary to stop using anti-tuberculosis drugs. After side effects disappear, antituberculosis drugs are gradually reintroduced, starting with those least likely to cause such a reaction (for example, isoniazid). Start with a low dose and gradually increase over 3 days. This procedure is repeated with the addition of one drug each time.

Management of hepatitis caused by taking antituberculosis drugs. If a patient develops hepatitis during treatment, it may be caused by anti-tuberculosis treatment or something else. It is important to rule out other possible causes before it is determined that it is hepatitis caused by anti-tuberculosis drugs. Taking anti-tuberculosis drugs should be stopped until the time

until the liver tests come back to normal. Asymptomatic jaundice without hepatitis is most likely caused by taking rifampicin. After the hepatitis disappears, anti-tuberculosis drugs are gradually reintroduced, one at a time. However, if clinical jaundice appears as a result of hepatitis, it is recommended not to use pyrazinamide. The proposed regimen consists of an intensive phase - 2 months of SHE every day and 10 months of a maintenance phase of HE (2 SHE/10 HE). Patients with severe TB who have drug-induced hepatitis can die without taking anti-tuberculosis drugs. In such a situation, the patient should be treated with the two least hepatotoxic drugs, S and E. After the hepatitis problem is resolved, the usual course of TB treatment should be resumed.

Prevention of adverse reactions to antituberculosis drugs. It is possible to prevent the occurrence of some side effects, for example, peripheral neuropathy, which occurs as a result of taking isoniazid. This reaction can be present in pregnant women and in HIV-infected patients, in alcohol abusers, as well as in those with poor nutrition, diabetes and chronic liver damage. These patients should receive prophylactic treatment with pyridoxine, 20-40 mg per day, along with antituberculosis drugs.

Emergency aid for isoniazid poisoning. Toxic effect: the drug is well absorbed in the gastrointestinal tract. Excreted by the kidneys. The toxic effect is associated with excitation of the central nervous system. Damage to parenchymal organs and digestive organs. The clinical picture of poisoning begins with nausea and vomiting. Dizziness to coma, convulsions quickly appear. Disturbances of cardiac activity occur. Treatment: gastric lavage with potassium permanganate solution, forced diuresis up to 2 L, IV lasix 2.0, up to 500 ml sodium bicarbonate, 200.0 5% glucose with vitamin B6 up to 10.0, vitamin C up to 10.0. prednisolone, cardiac glycosides.

Questions for self-control

1.What are the common approaches to treating tuberculosis?
2.What are the main principles of antituberculosis chemotherapy? 3. What are the main courses of chemotherapy?
4. What are the categories and treatment regimens for tuberculosis patients? 5. Classification of antituberculosis drugs.
6. Mechanism of action, doses, ways of introducing anti-tuberculosis drugs into the body. 7. What are the side effects of anti-tuberculosis drugs, their diagnosis and prevention?
8. Criteria for curing tuberculosis.

Indicative tasks for processing theoretical material

0 orientation map regarding the student's independent work with literature on the topic of the class (performed in writing).

No	Main tasks	Instructions	Answers
1.	**Learn:** Basic principles treatment of a patient with tuberculosis.	Give a list of the main principles of treatment of tuberculosis patients	
2.	Basic cour seantituberculosis chemotherapy	Specify the stages	
3.	Classification of antituberculosis drugs drugs	Specify groups A, B, C.	

4.	The main antituberculosisdrugs a nd recommended doses	Give a list of the main antituberculosis drugs and indicate the recommended doses	
5.	Categories treatment patients with tuberculosis	Specify treatment categories and their main features	
6.	Standard modes chemotherapy accord ing tocategories	Specify the regimen of chemotherapy for patients according tocategories	
7.	Side effects against tuberculosis drugs	Give a list of the main antituberculosis drugs and indicate their side effects	
8.	Treatment criteria tuberculosis	Specify the criteria for curing tuberculosis.	

2. Practical works (tasks) to be performed

1. Collect anamnesis taking into account the tolerance of medicines. 2. Determine the category of treatment

3.Plan the main course of tuberculosis chemotherapy in patients depending on the category.

4. Diagnose side effects of antituberculosis drugs and take countermeasures.

3. Test tasks for self-control

1. The patient, who is being treated for infiltrative pulmonary tuberculosis, developed a sleep disorder, depression, and polyneuritis. This is related to the reception:

A. Rifampicin B.
Pyrazinamide S.
Ethionamide
D. Streptomycin E.
Isoniazid

2. The patient was first diagnosed with focal pulmonary tuberculosis in the phase of infiltration and disintegration of MBT (-). What category of patients according to WHO recommendations does he belong to?

A. To I C.
To II C.
To III D.
To IV
E. None of the above

3. Isoniazid is included in the complex therapy of a patient with tuberculosis. With which method of administration of the drug will its highest bactericidal concentration be created?

A. Oral
V. Endolumbar S.
Intravenous D.
Endopleural
E. Intramuscular

4. The patient, who was admitted to the hospital for treatment, was prescribed complex chemotherapy. What is an absolute contraindication to the appointment of streptomycin?

A. Diabetes mellitus

B. Hepatitis
C. Hypertensive disease
D. Pyelonephritis
E. Lesions of the VII pair of cranial nerves

5. A 9-year-old child was admitted to the children's department of the hospital with a diagnosis of "Tuberculosis of the intrathoracic lymph nodes in the infiltration phase." There is a history of tube contact. What chemotherapy drugs should be prescribed to the child?
A. Isoniazid + ethambutol + PASK + streptomycin
B. Isonifazid + streptomycin + tibon + ethambutol
C. Rifampicin + PASK + isoniazid + ethambutol D.
Phtivazid + tibon + kanamycin
E. Isoniazid + rifampicin + pyrazinamide + ethambutol

6. A 25-year-old patient was admitted to an anti-tuberculosis hospital for disseminated pulmonary tuberculosis. He was prescribed a standard treatment scheme according to the 1st category. The weight of the patient is 60 kg. What average daily dose of isoniazid should be taken by the patient?
A. 0.1 g
B. 1.5 g
P. 1.0 g
D. 0.6 g
E. 0.3 g

7.Patient K., 42 years old, suffers from fibro-cavernous tuberculosis combined with alcoholism and chronic hepatitis. Which drug has a pronounced hepatotoxic side effect?
A. Isoniazid.
B. Streptomycin
C. Rifampicin D.
Ethambutol
E. PASK.

8.A patient with infiltrative pulmonary tuberculosis is prescribed 5 antituberculosis drugs. Which of the listed drugs has a side effect on the optic nerve?
A.
Pyrazinamide
B. Rifampicin
C. Ethambutol
D. Streptomycin
E. Isoniazid

9. Patient, 32 years old. He was admitted to the hospital of the anti-tuberculosis dispensary with complaints of a periodic increase in body temperature up to 37.0ºC, weakness. After x-ray and laboratory tests, the diagnosis was established: VDTB (February 15, 2005) of the upper lobe of the right lung (focal, infiltration phase), Destr-, MBT-M-K- RezistORezistII0, HISTO, Cat3Kog4(2005). What treatment regimen should be prescribed to the patient?
A.HRZE
B.HZES
C.RZEEt
D.HRZ
E.ZESPt

10. A 28-year-old patient was admitted to the inpatient tuberculosis dispensary with complaints of weakness, an increase in body temperature to 38.0ºC, a cough with sputum, and a decrease in body weight. X-ray: in the upper part of the right lung, infiltrative changes with the presence of destruction, foci of insemination in S 1,2 of the right and S 6 of the left lung are determined. In the analysis of sputum MBT+. What treatment regimen should be prescribed to a patient in the intensive phase?

A.HRZPt
B.HRZS
C.RZEEt
D.HRZ
E.ZESPt

11. The patient is 40 years old. She was admitted to the inpatient tuberculosis dispensary with complaints of cough with sputum, weakness, and an increase in body temperature up to 37.3ºC. For the first time, pulmonary tuberculosis was detected 4 years ago. After successful treatment, clinical well-being was noted in the next 3 years. An infiltrative shadow of an inhomogeneous structure is determined in the upper part of the left lung on the X-ray examination and tomograms. In the sputum, MBT was detected, sensitive to all antimycobacterial drugs of the first series. What treatment regimen does the patient need in the intensive phase?

A.HRZPtQ
B.HRZES
C.RZEEt
D.HRZ
E.ZESPt

12. Patient, 53 years old. He has been suffering from pulmonary tuberculosis for 6 years. Two years ago, the patient was diagnosed with CTB (September 2, 1994) of the lungs (fibro-cavernous, infiltration and insemination phase), MBT+M+K+Resist-ResistII0, HISTO CatCog 3(2002). What treatment regimen should be prescribed to a patient in the intensive phase?

A.HRZPtQ
B.HRZES
C.RZEEt
D.HRZ
E.ZESPt

13.The patient was diagnosed with focal tuberculosis of the upper lobes of the lungs. Anti-tuberculosis therapy was prescribed. After taking the drugs for two weeks, the patient developed yellowness of the sclera, nausea, and pain in the right hypochondrium. In the biochemical analysis of blood, an increase in the content of AsAT and AlAT was revealed. Which of these drugs is most likely to cause complications?

A. Rifampicin
B. Isoniazid
S. Streptomycin
D. Ethambutol
E. Pyrazinamide

4.Individual tasks for students of higher education on the topic

Topics of reports/abstracts:

-pharmacological properties of the main anti-tuberculosis drugs
- modern antituberculosis drugs for the treatment of MDR-TB
- Treatment of tuberculosis of the mucous membrane of the oral cavity and jaw bones

5.List of recommended literature (main, additional, electronic information resources):

Main:
1. Phthysiatry: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others] ; under the editorship V. I. Petrenko. Kyiv: Medicine, 2018. 471 p.
2. Current issues of phthisiology: manual / D. G. Kryzhanoskyi, V. A. Freiwald, N. A. Marchenko (and others). Dnipropetrovsk: T. K. Serednyak, 2017. 155 p.
3. Phthisiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. Kharkiv: KhNMU, 2016. 176 p.

Additional:
1. Prevention of tuberculosis. Study guide for students and interns of VNMZ IV accreditation level and doctors / V. I. Petrenko, M. G. Dolynska, A. V. Aleksandrin, V. V. Petrenko. Kyiv: 2 Print, 2017. 88 p. URL:http://tb.ucdc.gov.ua/uploads/files/prophilaktica.pdf.
2. Biochemical Value Dynamics in Patients with Multidrug-Resistant Tuberculosis/HIV with CD4+ Lymphocyte Cells below 50 Cells/μCLandits Variability in the Application of Adjuvant Immunoglobulin Therapy / NA Matsegora, AV Kaprosh, PB Antonenko // International Journal of Mycobacteriology. 2019; 8 (4):374 - 380. (SCOPUS)
3. Global tuberculosis report 2019 (WHO/CDS/TB/2019.15). Geneva, World Health Organization. 2019 URL: https://apps.who.int/iris/bitstream/handle/10665/329368/ 9789241565714-eng.pdf
4. Order of the Ministry of Health of Ukraine No. 530 of February 25, 2020 "Standards of tuberculosis health care". URL: https://phc.org.ua/sites/default/files/users/user90/Nakaz_MOZ_vid_25.02.202 0_530_Standarty_medopomogy_pry_TB.pdf
5. UBERCULOSIS Clinical guideline of the Ministry of Health of Ukraine, based on evidence No. KH 2021-530 dated 11/17/2021. URL: https:///www.dec.gov.ua/mtd/tuberkuloz/
6. Order of the Ministry of Health of Ukraine No. 287 dated February 1, 2019 "On the approval of the Infection Control Standard for health care institutions that provide assistance to tuberculosis patients." URL: https://zakon.rada.gov.ua/laws/show/z0408-19#Text

Electronic information resources
1. Website of the Public Health Center of the Ministry of Health of Ukraine.http://phc.org.ua/
2. Tuberculosis issues on the WHO website.http://www.who.int/tb/en/
3. National Tuberculosis Resource Center.http://tb.ucdc.gov.ua/
4. www.dec.gov.ua/mtd/dodatki/2016_729_VGC/2016_729_YKPMD_VGC.doc
5. http://www.ifp.kiev.ua/doc/people/tubzar.htm

Topic 5.

Prevention of tuberculosis. Dispensary supervision. Clinical analysis of patients.

Goal.

Familiarize yourself with the general approaches to the prevention of tuberculosis: with the method of BCG vaccination and revaccination.

Basic concepts:types of tuberculosis prevention (specific, non-specific), the purpose, indications and method of chemoprophylaxis, the method of BCG vaccination and revaccination, the history of the invention of the BCG vaccine, indications, contraindications to vaccination, complications of vaccination.

Plan

1. Theoretical questions.

Prevention of tuberculosis occupies an important place in the complex of measures aimed at combating tuberculosis.

Prevention of tuberculosis includes:

- social prevention;
- infection control;
- sanitary prevention;
- primaryprevention;
- secondaryprevention

Social preventionaddressed to:

- improvement of environmental conditions;
- improving the material well-being of the population;
- strengthening the health of the population;
- improvement of nutrition and living conditions;
- development of physical culture and sports;
- carrying out measures to combat alcoholism, drug addiction, smoking and other bad habits.

Infection control

Prevention of transmission of tuberculosis infection and infection of healthy persons and superinfection of tuberculosis patients is achieved by:

- Administrative control (rational placement of departments in an anti-tuberculosis institution, isolation of infectious patients until the end of bacterial isolation by microscopy, regulation of patient flows)
- Engineering control (ventilation system, ultraviolet lamps)
- Personal protection (cough hygiene for sick patients, surgical masks for sick bacteriolators, respirators with hepa filters for medical personnel who work with patients who have a positive smear).

Sanitary preventionpursues the goals of preventing TB infection of healthy people, protecting and making safe contact with a tuberculosis patient in an active form (especially with bacterial excretion) of the people around him at home and at work. One of the parts of this prevention is the early and timely detection of tuberculosis. An important component of sanitary prevention is the implementation of social, anti-epidemic and medical measures in the focus of tuberculosis infection (in the family and home of a tuberculosis patient who emits MBT).

The criteria for epidemic safety of a focus of tuberculosis infection are:

- massive and constant discharge of MBT patients;
- family living conditions of the patient;
- the patient's behavior;
- general culture and sanitary literacy of the patient and the people around him.

Based on these criteria, foci of tuberculosis infection are divided into three groups according to the degree of epidemic safety. According to the group, the volume and content of preventive measures in the outbreak are determined.

Group I — the most unfavorable foci: 1) a patient with existing bacterial excretion who lives in a communal apartment or dormitory; 2) there are children, teenagers, and pregnant women in the patient's family; 3) the family has poor living conditions, the patient and those around him do not follow hygienic rules of behavior.

II group — relatively unfavorable foci: 1) the patient has little bacterial excretion, a persistent tubercular process; 2) there are adults in the patient's family, there are no aggravating factors; 3) the patient is a conditional bacterial isolate, but there are children in his family and there are aggravating factors

III group — potentially dangerous foci: 1) a diseased conditional bacteriostatic agent (bacteriolytic activity has stopped, but 2 years have not yet passed); 2) there are only adults in the patient's family; 3) the patient and those around him perform all the necessary sanitary and hygienic measures for the prevention of tuberculosis.

Primary prevention. Vaccination with BCG vaccine at birth, revaccination at 7 years after tuberculin diagnosis.

Secondary prevention. Secondary prevention is carried out for persons who have had contact with tuberculosis patients and for the treatment of established latent tuberculosis infection in medical and social risk groups in which tuberculin diagnostics are performed. Treatment is carried out for 6 months (3 months twice a year) with isoniazid or a two-component chemotherapy regimen (isoniazid + ethambutol) for 3 months.

Chemoprophylaxis with anti-tuberculosis drugs is carried out to prevent tuberculosis in the following population groups:

- persons who are in constant contact with tuberculosis patients with bacterial excretion;
- HIV-infected with a curve of tuberculin samples, with hyperergic reactions or an increase in tuberculin sensitivity.

Chemoprophylaxis uses:

- isoniazid in a dose of 0.3-0.45 g daily for at least 6 months to persons who have not suffered from tuberculosis and are in contact with a patient who secretes MBT in foci of tuberculosis infection.
- or a two-component regimen of chemoprophylaxis, the duration of which is reduced by 2 times: 3HE or 3HZ.

Chemoprophylaxis is not given to persons with foci of tuberculosis infection, where patients secrete chemoresistant MBT.

BCG vaccination and revaccination. The human body has a natural resistance to tuberculosis infection. This property is born and inherited. However, this immunity is not absolute, because under the influence of worsening living conditions, severe nervous and mental shocks, and for other reasons, it can be broken. An example can be the "Lübeck tragedy", which entered the history of phthisiology. Its essence is that in Lübeck (1930), due to a laboratory error, 252 newborns were given a virulent strain of MBT instead of the BCG vaccine. 68 children soon died, and in the patho-anatomical autopsy of the corpses, the primary focus was found in the intestines and mesenteric lymph nodes in 85% of cases, and in only 15% - in the lungs, oral cavity, and pharynx (in those years, the BCG vaccine was produced in liquid form and was administered per os with mother's breast milk). 131 children fell ill, but all survived. Observing them for a long time, the following distribution of foci was revealed: in most children, the primary focus was found in the lymph nodes of the abdominal cavity, in some children - in the cervical lymph nodes of the abdominal cavity, and only in 11 children - in the lungs and bronchial lymph nodes.

53 newborns did not get sick at all. All of the above indicates that a person is born with a congenital disadvantage to tuberculosis infection, but the degree of immunity in children is not the same.

Immunity to tuberculosis infection can only be non-sterile, acquired, that is, it is a specific process in the body that occurs in response to the penetration of the tuberculosis pathogen into the body. Koch's classic study serves as proof of this. In 1891 R. Koch described an interesting phenomenon known as the "Koch phenomenon". The essence of the phenomenon is as follows: if a pure culture of MBT is injected under the skin of a healthy guinea pig, then over the next 10-14 days, an infiltrate forms at the injection site, which is later covered with ulcers, and the ulcer does not heal until the animal dies. Moreover, there is a pronounced reaction of regional lymph nodes (sharp increase in size, caseous degeneration). If subcutaneous

to administer MBT to a guinea pig, which had previously (for 4-6 weeks) been administered MBT by a different route - intranasally, then the picture will be different: a large infiltrate quickly forms at the site of MBT injection, which is covered with ulcers and the ulcer quickly heals with a scar. At the same time, regional lymph nodes do not react noticeably. The Koch phenomenon shows that the reaction of the macroorganism to the primary and secondary administration of MBT is not the same. Primary infection to a certain extent immunized the body to the causative agent of tuberculosis. That is why, apparently, a person gets infected much more often than he gets sick.

To create artificial non-sterile anti-tuberculosis immunity, Calmet vaccination with a strain of mycobacterium tuberculosis obtained by French scientists Calmet and Gerin (BCG) in 1919 is used.

BCG is an avirulent strain of MBT, which was obtained from a virulent culture of the bovine type after weakening it by long-term cultivation on a nutrient-starved medium (on potato slices saturated with bovine bile with the addition of 5% glycerol).

From 1906, Calmet and Gerin carried out transplants on potatoes every 15 days and found that after 4 years, the tubercular culture lost its virulence for cattle and guinea pigs, but remained virulent for horses and rabbits.

After 230 consecutive passages in the same conditions (temperature 38 C) for 13 years, the BCG strain was obtained. Which was introduced into the body of an animal or a person, and it did not cause a tuberculous process, but caused immunity.

The BCG strain is harmless to all laboratory animals and does not regain its virulence when mated. This new property of the Calmet and Gerin MBT is firmly established and is inherited.

The BCG vaccine is safe and causes a kind of symbiosis of macro- and microorganism in the living organism, which is the basis for non-sterile anti-tuberculosis immunity. As soon as the symbiosis ceases as a result of the natural digestion of microbes by cellular enzymes, as well as their excretion by bile, intestines, mammary glands, etc., the immunity that arose ceases to exist.

Previously, a liquid vaccine was used, which was a suspension of a weakened bovine strain of MBT in an isotonic sodium chloride solution. Now a dry vaccine is used, the shelf life of which is 6-8 months. The vaccine is live tuberculosis mycobacteria of the BCG-1 vaccine strain, which are lyophilized in a 1.5% sodium glutamate solution. One ampoule sealed under vacuum contains 1 mg of BCG - 20 doses, that is, each dose is 0.05 mg. drug An ampoule of physiological solution in the amount of 2 milliliters is added to the ampoule of the vaccine. The vaccine should be stored at room temperature

5 C in a darkened place.

According to the order of the Ministry of Health of Ukraine No. 1091 and the instructions for the use of BCG tuberculosis vaccine, primary vaccination by the intradermal method is carried out for all sighted newborns. It is performed by neonatologists or midwives under the supervision of a neonatologist or phthisiologist. Healthy full-term children are vaccinated on the 4-5th day after birth. In the history of the development of the newborn, the date of vaccination is noted, and 1-2 weeks after the revaccination, a papule with a diameter of 5-10 mm is formed, in place of which a superficial scar of 5-6 mm is formed after 2-3 months.

Vaccination is carried out by specially trained personnel with disposable one-milliliter syringes, thin needles with a short section. The ampoule is carefully inspected and the vaccine is sterilized and neutralized for defects (cracks, unclear labels, etc.). If no defects are found, the neck of the ampoule is treated with alcohol, the ampoule is opened and injected with a 2-milliliter sterile syringe with a thick needle of 2 ml of physiological solution, which is added, and the vaccine is dissolved within 3 minutes. For vaccination, 0.1 ml of diluted vaccine (0.05 mg) is collected from the ampoule. The diluted vaccine is inactivated after 20 minutes. The vaccine is injected at the border of the upper and middle third of the outer surface of the left shoulder strictly intradermally, having previously treated the skin of the shoulder with 70% alcohol.

After the injection of the vaccine, a whitish papule is formed, which disappears after 15-20 minutes. Changes at the site of vaccine administration (papule, vesicle, pustule, scar, crust) should be noted in the history of the child's development at the age of 1, 2, and 12 months.

Very rarely (0.02-0.06%) there may be complications of BCG vaccination (abscesses), which appear in the form of cold abscesses, axillary lymphadenitis on the left, as well as ulcers and keloid scars that do not heal for a long time at the site of vaccine administration. Children with rabies must be supervised by phthisio-pediatricians, receiving both local and specific treatment and are not subject to further revaccination.

The vaccine is contraindicated for children with immunodeficiency, enzyme therapy, birth trauma, elevated body temperature, sepsis, purulent-inflammatory skin diseases, hemolytic jaundice. After normalization of the general condition, they are vaccinated and discharged home.

After vaccination, the child from the tuberculosis center is isolated for 6-8 weeks, that is, for the period necessary for the development of immunity.

Healthy children and adolescents who have a negative Mantoux reaction with 2 TO PPD-L are subject to revaccination. The interval between Mantoux test and revaccination is not less than 3 days and not more than 2 weeks. Periods of revaccination: 7 years. Immunity after vaccination lasts for 3-5 years. Children who received preventive vaccinations against smallpox, diphtheria, etc., can be revaccinated no earlier than 2 months after the last vaccination.

Children who received BCG can receive other vaccinations no earlier than 3-6 months after revaccination. Both vaccination and revaccination against tuberculosis are mandatory in Ukraine and are included in the system of nationwide measures to combat tuberculosis.

Dispensary category of patient registration.

To the 1st categoryinclude new cases: patients with newly diagnosed tuberculosis of various localizations with bacterial secretion (VDTB MBT+), as well as patients with other (severe and widespread) forms of the disease of various localizations without bacterial secretion (VDTB MBT–): miliary, disseminated tuberculosis, meningitis, caseous pneumonia , pleurisy (with a severe course), tuberculous pericarditis, peritonitis, intestinal tuberculosis, spinal tuberculosis with neurological complications, urogenital tuberculosis.

The widespread form should be understood as the spread of the process to 2 or more lung segments or 2 or more organs. Severe tuberculosis processes (in the absence of bacterial excretion) include such a course when there is pronounced tuberculous intoxication, which is accompanied by a febrile body temperature, destruction in the lungs is determined, and there is a threat to the patient's life.

To the 2nd categoryinclude any cases of pulmonary and extrapulmonary tuberculosis that are registered for re-treatment (patients were previously treated for more than 1 month): relapse of tuberculosis of various localization with bacterial release (RTB MBT+) and without bacterial release (RTB MBT–); treatment after interruptions with bacterial release (VDTB LPP MBT+) and without bacterial isolation (VDTB LPP MBT–), treatment failure, other.

To the 3rd categoryinclude patients with new cases (diagnosed tuberculosis for the first time) without bacterial isolation (VDTB MBT–), with a limited process in the lungs (with a lesion of no more than 2 segments) and extrapulmonary tuberculosis, which is not assigned to the 1st category; as well as children with tuberculosis intoxication (TI) and tuberculosis of the intrathoracic lymph nodes or primary tuberculosis complex in the calcification phase in case of preserved activity of the process. In statistical accounting, data on children with tuberculosis intoxication are entered under the rubric "tuberculosis of unspecified localization".

To the 4th categoryinclude patients with chronic tuberculosis of various localization with and without bacterial secretion.

To the 5th categoryinclude persons with residual changes after being cured of tuberculosis, as well as those classified as at risk of tuberculosis disease or its recurrence.

Group 5.1. Persons with residual changes after treatment of tuberculosis (TB) of various localization are included.

Group 5.2. Persons in contact with tuberculosis patients, who secrete MBT, as well as animals with tuberculosis; with latent tuberculosis infection (mantoux tuberculin test curve with 2 TO, hyperergic reactions to tuberculin), established in medical and social risk groups; young children who are in contact with patients with active tuberculosis who do not secrete MBT; children whose parents are in contact with animals infected with tuberculosis.

Group 5.3. Adults with tuberculous changes in the lungs and other organs with uncertain process activity are included.

Group 5.4. These include: children and adolescents infected with tuberculosis, as well as from risk groups (tuberculin test deviation, hyperergic reaction to tuberculin, an increase in tuberculin sensitivity by 6 mm per year, as well as children with chronic somatic diseases); children who were not vaccinated with BCG during the newborn period; children with post-vaccination complications of BCG.

Group 5.5. These include: children and adolescents, in whom it is necessary to clarify the etiology of sensitivity to tuberculin (post-vaccination or infectious allergy) or the nature of changes in the lungs and other organs for the purpose of differential diagnosis; children and adolescents with tuberculous changes in the respiratory organs of uncertain activity.

Questions for self-control

1. What types of measures are included in the prevention of tuberculosis?
2. What is social prevention aimed at?
3. What is meant by the term "infection control"?
4. What are the goals of sanitary prevention?
5. On the basis of what criteria are foci of tuberculosis infection distributed?
6. What is the characteristic of groups of foci of tuberculosis infection according to the degree of epidemiological danger?
6. What is BCG vaccine?
7. What is the route of administration of the BCG vaccine, what are the stages of formation of the post-vaccination sign?
8. What are the terms of development of immunity after BCG vaccination, characteristics of post-vaccination immunity?
9. At what age is BCG vaccination and revaccination carried out?
10. What are the contraindications to BCG vaccination and revaccination?
11. What are the complications of BCG vaccination and revaccination?
12. What are the doctor's tactics regarding children with post-vaccination complications?
13. What is the method of chemoprophylaxis, to which categories is it prescribed?
15. What are the categories of dispensary supervision, the characteristics of each category?

Indicative tasks for processing theoretical material.

Orientation map for independent work with literature on the topic of the lesson (to be done in writing).

No	Main tasks	vases	Answers
1.	**Know:** Kinds preventivemeasures	1. Prevention of tuberculosis includes: – – – – -	
2.	BCG vaccine: properties	1. Describe the properties of the vaccine	

	those, the method of application.	BCG, indications for use. 2. Explain the technique of BCG vaccination and revaccination. 3. Periods of formation of a post-vaccination sign.	
3.	Selection of contingents for vaccinations	Contraindications to BCG vaccination	
4.	Selection of contingents for revaccination	Contraindications to BCG revaccination, significance of tuberculin diagnostics.	
5..	Chemoprophylaxist uberculosis	Indications for chemoprophylaxis, drug dose, appointment period	
6.	Hearths tuberculosisinfections	Characteristics of tuberculosis foci infections according tolet's compare epidemic safety	
7.	The work of a doctor in the focus of tuberculosis infection with sick children's department	Draw up a plan of preventive measures for persons who live in the focus of tuberculosis infection.	
8.	Dispensary categories accounting	1.Give characteristics of each 5 categories of dispensary accounting.	

Practical works (tasks) to be performed.

Mastering practical skills.

1.Explain the methods of prevention of tuberculosis.

2.Determine contraindications to BCG vaccination and revaccination.

3. To classify centers of tuberculosis infection.

4. To use the principles of conducting anti-tuberculosis measures in the cells. Discussion of theoretical issues:

1. What types of measures are included in the prevention of tuberculosis?
2. What is social prevention aimed at?
3. What is meant by the term "infection control"?
4. What are the goals of sanitary prevention?
5. On the basis of what criteria are foci of tuberculosis infection distributed?
6. What is the characteristic of groups of foci of tuberculosis infection according to the degree of epidemiological danger?
6. What is BCG vaccine?
7. What is the route of administration of the BCG vaccine, what are the stages of formation of the post-vaccination sign?
8. What are the terms of development of immunity after BCG vaccination, characteristics of post-vaccination immunity?
9. At what age is BCG vaccination carried out?
10. What are the contraindications to BCG vaccination?
11. What are the complications of BCG vaccination?
12. What are the doctor's tactics regarding children with post-vaccination complications?
13. What is the method of chemoprophylaxis, to which categories is it prescribed?

3.Test tasks for self-control.

1. A healthy baby weighing 3 kg 200 g was born in the maternity hospital. Vaccination against tuberculosis will be carried out:

A. BCG vaccine at a dose of 0.5 mg

B. BCG vaccine at a dose of 0.05 mg C. BCG vaccine at a dose of 0.005 mg

D. BCG vaccine in a dose of 0.025
mg E. BCG vaccine in a dose of 0.1
mg

2. A 5-year-old girl lives in the center of a tuberculosis infection. Mantoux sample with 2 TO - infiltrate with a diameter of 14 mm. There are no complaints. No pathological changes were detected during the objective examination and on the X-ray examination of the chest organs. What tactics are appropriate in addition to dispensary surveillance?

A. Chemoprophylaxis appointment
B. BCG revaccination C. Vitamin
appointment
D. Appointment of immunostimulants
E. Prescribing anti-inflammatory drugs

3. Girl, 7 years old, healthy. A Mantoux test with 2 TOs was planned. The reaction is negative. There is no contact with a tuberculosis patient. What preventive measures is the child subject to?

A. Mantoux test
B. Prescribing chemoprophylaxis C.
BCG revaccination
D. Conducting a repeated Mantoux test with 2
TOE E. Conducting a Mantoux test with 10 TOE

4. Boy, 10 months. He was born with a birth injury, which is why he was not vaccinated with the BCG vaccine. What examination must be done before vaccination if there are no contraindications?

A. X-ray of chest organs B. Koch test
S. General blood analysis
D. Mantoux sample with 2
TO
E. Determination of the immunogram

5. A 24-year-old woman with focal tuberculosis of the upper lobe of the right lung in the phase of infiltration and disintegration of MBT(+) gave birth to a full-term, healthy baby weighing 3500 g. After birth, the baby was immediately isolated from the sick mother. What should be the tactics of the doctor in relation to the child?

A. Carry out chemoprophylaxis with isoniazid
B. Carry out vaccination with BCG vaccine
S. Make an x-ray of the chest organs D. Vaccinate
with the BCG-M vaccine
E. Conduct a Mantoux test with 2 TO PPD-L

6. The boy, a first-grader, contracted measles 6 months later, is now healthy. Mantoux test with 2 TO was carried out as planned. The reaction is negative. There is no contact with a tuberculosis patient. When should the first BCG revaccination be carried out in:

A. 7 years old
B. 3 years
V. 18 years old
G. 10 years old
D. 3-4 birthday

7. A child from a center of tuberculosis infection of the 1st degree is examined as a contact in an anti-tuberculosis dispensary. Which of these tuberculin tests is included in the child's examination plan:

A. Mantoux test with 2
TO B. Mantoux test with
10 TO C. Pirquet test
G. Koch's test
D. Hemotuberculin test

8. Child, 4 days after birth, weighing 3 kg. healthy What is the route of administration of the BCG vaccine to this child:

A. Orally
B. Intramuscular B.
Intradermal D.
Subcutaneous
D. All the above ways are used

9. A 4-year-old child has contact with his father, who is suffering from an active form of tuberculosis. She was examined in an anti-tuberculosis dispensary. The curve of the tuberculin sample was determined. Chemoprophylaxis is prescribed. Chemoprophylaxis of children with "virage" is carried out:

A. Ethambutol 6 months B.
Streptomycin 2 months C.
Rifampicin 6 months D.
Isoniazid 3 months
D. Isoniazid for 6 months

10. The child was revaccinated at the age of 7. After 3 months, there were complaints of pain and a tumor-like formation in the left axillary region, an increase in body temperature to 37.2 0 C. Objectively: a tumor-like formation up to 1.5 cm in diameter was found in the left axillary fossa. A likely diagnosis?

A. Post-vaccination
lymphadenitis B.
Lymphogranulomatosis
B. Sarcoidosis
G. Purulent nonspecific lymphadenitis D.
Axillary hidradenitis

11. The child is 7 years oldill measles.Sometime later recovery is it possible to revaccinate BCG?

A. After 1-2 months
B. After 6 months
C. After 2 weeks D.
After 3 weeks
D. Immediately after recovery

12. A patient with an open form of tuberculosis is hospitalized in a tuberculosis hospital. Who should carry out final disinfection at the patient's place of residence?

A. Employees of SES. V.
By members of the
patient's family.
S. Medical staff of the anti-tuberculosis dispensary. D.
Medical staff of the district polyclinic
E. Medical staff of the tuberculosis hospital.

13. Students of higher education institutions undergo annual medical examinations. What method of research is carried out by them for the purpose of early detection of tuberculosis?

A. FG of chest organs
B. X-ray of chest organs C. CT scan of chest organs.
D. TG of chest organs.
E. Radiography of chest organs.

14. A healthy person was in long-term contact with a tuberculosis patient and is under the supervision of an anti-tuberculosis dispensary. What drug should she use for chemoprophylaxis?

A. PASK
B. Rifampicin
C. Ethambutol
D. Isoniazid E. Pyrazinamide

15. The 27-year-old girl was in contact with her mother, who was suffering from tuberculosis. She was examined in an anti-tuberculosis dispensary. Mantoux's reaction with 2 TO is doubtful. There are no clinical manifestations of the disease. X-ray examination of the lungs revealed no pathological changes. Chemoprophylaxis is prescribed. What dose of isoniazid should she be prescribed?

A. 1 mg/kg of body weight B. 5 mg/kg of body weight C. 15 mg/kg of body weight
D. 12 mg/kg of body weight E. 7 mg/kg of body weight

4. Individual tasks for students of higher education on the topic

Topics of reports/abstracts:
- history of BCG vaccine invention
- BCGs and their treatment
- contraindications to BCG vaccination

5. List of recommended literature (main, additional, electronic information resources):

Main:
1. Phthysiatry: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others] ; under the editorship V. I. Petrenko. Kyiv: Medicine, 2018. 471 p.
2. Current issues of phthisiology: manual / D. G. Kryzhanoskyi, V. A. Freiwald, N. A. Marchenko (and others). Dnipropetrovsk: T. K. Serednyak, 2017. 155 p.
3. Phthisiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. Kharkiv: KhNMU, 2016. 176 p.

Additional:
1. Prevention of tuberculosis. Study guide for students and interns of VNMZ IV accreditation level and doctors / V. I. Petrenko, M. G. Dolynska, A. V. Aleksandrin, V. V. Petrenko. Kyiv: 2 Print, 2017. 88 p. URL:http://tb.ucdc.gov.ua/uploads/files/prophilaktica.pdf.
2. Biochemical Value Dynamics in Patients with Multidrug-Resistant Tuberculosis/HIV with CD4+ Lymphocyte Cells below 50 Cells/μCLandits Variability in the Application of Adjuvant Immunoglobulin Therapy / NA Matsegora, AV Kaprosh, PB Antonenko // International Journal of Mycobacteriology. 2019; 8 (4):374 - 380. (SCOPUS)

3. Global tuberculosis report 2019 (WHO/CDS/TB/2019.15). Geneva, World Health Organization. 2019 URL: https://apps.who.int/iris/bitstream/handle/10665/329368/9789241565714-eng.pdf
4. Order of the Ministry of Health of Ukraine No. 530 dated February 25, 2020.

"Standards of tuberculosis health care". URL: https://phc.org.ua/sites/default/files/users/user90/Nakaz_MOZ_vid_25.02.2020_530_Standarty_medopomogy_pry_TB.pdf
5. UBERCULOSIS Clinical guideline of the Ministry of Health of Ukraine, based on evidence No. KH 2021-530 dated 11/17/2021. URL: https:///www.dec.gov.ua/mtd/tuberkuloz/
6. Order of the Ministry of Health of Ukraine No. 287 dated February 1, 2019 "On the approval of the Infection Control Standard for health care institutions that provide assistance to tuberculosis patients." URL: https://zakon.rada.gov.ua/laws/show/z0408-19#Text
Electronic information resources
1. Website of the Public Health Center of the Ministry of Health of Ukraine.http://phc.org.ua/
2. Tuberculosis issues on the WHO website.http://www.who.int/tb/en/
3. National Tuberculosis Resource Center.http://tb.ucdc.gov.ua/
4. www.dec.gov.ua/mtd/dodatki/2016_729_VGC/2016_729_YKPMD_VGC.doc
5. http://www.ifp.kiev.ua/doc/people/tubzar.htm

Topic 6.

Pulmonary tuberculosis: primary and secondary forms. Clinical examination of patients.

Goal. Get acquainted with the pathogenesis of primary and secondary forms of tuberculosis, features of their course at the current stage, methods of diagnosis, causes of complications and their prevention.

Basic concepts: Get acquainted with the pathogenesis of primary and secondary forms of tuberculosis, features of their course at the present stage, forms, features of the X-ray picture of each form, diagnostic methods, causes of complications and their prevention.

Plan

1. Theoretical questions:

Tuberculous intoxication. The intoxication symptom complex in children with tuberculin test results is called tuberculous intoxication. Tuberculosis intoxication is a clinical syndrome consisting of a number of functional disorders of the body (pallor, lethargy, drowsiness, irritability, anorexia, tearfulness, low-grade fever) in children with tuberculin test deviation, when a thorough clinical and radiological examination fails to detect local changes in tissues and organs. The specific reactivity that has changed in tissues and organs is sometimes accompanied by paraspecific reactions (erythema nodosa, phlyktenulosis conjunctivitis or keratoconjunctivitis, hypertrichosis, micropolyadenia). Such children may have an enlarged liver, less often the spleen. On the blood side, lymphocytosis is noted (possible

lymphopenia), shift of the leukocyte formula to the left, accelerated ESR. During X-ray examination of chest organs, no specific changes are noted. Sometimes you can find an increase in the lung pattern in the basal area. In children who are in foci of tuberculosis infection or who have not been vaccinated with the BCG vaccine, functional disorders can be detected even in the pre-allergic period. In these cases, early intoxication proceeds as the so-called initial or invasive fever. With long-term tuberculosis intoxication, the following can be observed: stunted growth and body weight of the child, a long, narrow, flat chest, poor appetite, anemia. In the anamnesis, there are often indications of tuberculosis in parents or close relatives. Indications for frequent bronchitis, inflammation of the lungs, and pleurisy are also common.

The primary tuberculosis complex is characterized by the development of inflammatory changes in lung tissue, damage to regional intrathoracic lymph nodes, and lymphangitis. A distinction is made between uncomplicated and complicated course of the primary complex. With a complicated course, a large infiltrate with damage to a segment or lobe of the lung, disintegration with the formation of a primary cavern, damage to the bronchi, development of atelectasis in other parts of the lung, lymphogenous and hematogenous dissemination, as well as transition to primary tuberculosis with a chronic course can be observed. There may be paraspecific allergic reactions, increased sensitivity to tuberculin. In modern conditions, in most patients, the primary complex, especially under the influence of chemotherapy, has a mildly symptomatic course, subject to resorption, compaction and calcification. Calcification of the primary focus in the lungs and lymph nodes in adults is rare. In recent decades, the primary tuberculosis complex with typical bipolarity has become less common.

Tuberculosis of the intrathoracic lymph nodes develops as a result of primary tuberculosis infection in children, adolescents and young adults. There are infiltrative, tumor-like and so-called "small" variants of tuberculosis of the intrathoracic lymph nodes.

The infiltrative variant of tuberculosis of the intrathoracic lymph nodes is characterized not only by their increase, but also by the development of infiltrative changes in the lung tissue in its basal parts. Symptoms of intoxication prevail in the clinical picture of the disease.

"Small" variants of tuberculosis of the intrathoracic lymph nodes are manifested by their slight increase. X-ray diagnosis of "small" variants of tuberculosis of the intrathoracic lymph nodes in the infiltration phase is possible only by indirect signs (reduction of the root shadow structure, double contour of the median shadow and enrichment of the pulmonary pattern in the basal zone in a limited area). It is clinically manifested by moderate symptoms of intoxication.

Tumorous (tumorous) tuberculosis of the intrathoracic lymph nodes is a variant of primary tuberculosis, in which the caseous lesion of the lymph nodes predominates, manifested by an increase in the size of individual lymph nodes or groups, pronounced clinical symptoms and a tendency to a complicated course (bronchial lesions, bronchopulmonary lesions, foci of bronchogenic, lymphogenic and hematogenous dissemination, pleurisy). The contours of the lymph nodes on X-rays and tomograms are clear.

With all variants of tuberculosis of the intrathoracic lymph nodes, and most often with its chronic course, complications are possible in the form of an inflammatory reaction of the pleura,

specific damage to the bronchi with the development of segmental or partial atelectasis, dissemination to the lungs and various organs (bronchopulmonary forms of the process).

Focal tuberculosis of the lungs is characterized by the presence of small (up to 10 mm in diameter) foci of various genesis and age, mainly of a productive nature, localized in a limited area of one or both lungs and occupying 1-2 segments, and a mildly symptomatic clinical course. Focal forms include both those that arose recently, fresh (soft-focal) processes with the size of foci less than 10 mm, and older (fibrous-focal) formations with clearly expressed signs of process activity. Fresh focal tuberculosis is characterized by the presence of soft focal shadows with slightly blurred edges. With significantly pronounced perifocal changes that have developed on the periphery of the focus in the form of confluent broncholobular foci, they should be defined as infiltrative pulmonary tuberculosis. Fibrous-focal tuberculosis is manifested by the presence of dense foci, sometimes with the inclusion of lime, fibrous changes in the form of cords and areas of hyperpneumatosis. In the period of exacerbation, fresh, soft foci may also appear. With focal tuberculosis, the phenomena of intoxication and "chest" symptoms, as a rule, occur in patients in the period of exacerbation, in the phase of infiltration or decay.

When fibrotic focal changes are detected by X-ray fluorography method, it is necessary to carry out a thorough examination of patients to find out the activity of the process. In the absence of undoubted signs of activity, fibrotic focal changes should be considered as manifestations of an inactive process.

Infiltrative pulmonary tuberculosis is a specific exudative-pneumonic process with a length of more than 10 mm with a tendency to a progressive course. Clinical manifestations of infiltrative tuberculosis depend on the prevalence and severity of infiltrative-inflammatory (perifocal and caseous-necrotic) changes in the lungs.

The following clinical and radiological variants of infiltrative pulmonary tuberculosis are distinguished: lobular, round, cloud-like, periscissuritis, lobit.

All clinical and radiological variants of infiltrative tuberculosis are characterized not only by the presence of an infiltrative shadow, often with disintegration, but bronchogenic seeding is also possible. Infiltrative tuberculosis of the lungs can have an inapparent course and can be detected only during X-ray examination. More often, the clinical course of the process resembles other diseases (pneumonia, prolonged flu, bronchitis, catarrh of the upper respiratory tract, etc.). These are the so-called "masks" of tuberculosis.

Most patients have an acute or subacute onset of the disease. One of the symptoms of infiltrative tuberculosis can be hemoptysis in the general satisfactory condition of the patient.

Caseous pneumonia is an acute specific pneumonia, characterized by rapidly growing caseous-necrotic changes and a severe, often rapidly progressive, fatal course. It is characterized by: the patient's serious condition, febrile temperature, pronounced symptoms of intoxication, abundant catarrhal manifestations in the lungs, leukocytosis, a sharp shift to the left of the leukocyte formula, massive bacterial excretion. There is caseous pneumonia in the form of lobar and lobular forms. With rapid liquefaction of caseous masses, the formation of a giant cavity or multiple small caverns occurs.

Tuberculoma of the lungs - of various genesis, as a rule, an encapsulated formation with a preference for caseosis, the size of which is more than 1 cm in diameter, with a poor clinic. There are tuberculomas of the infiltrative-pneumonic type, homogeneous, layered,

conglomerate and so-called "pseudotuberculomas" — filled caverns. On an X-ray, tuberculomas appear as a rounded shadow with clear contours. In the focus, sickle-shaped illumination due to decay can be observed, sometimes - perifocal inflammation and a small number of bronchogenic foci, as well as areas of calcification. There are single and multiple tuberculomas. There are small tuberculomas (up to 2 cm in diameter), medium (2-4 cm) and significant (more than 4 cm in diameter).

There are 3 clinical variants of the course of tuberculosis: progressive, characterized by the appearance at a certain stage of the disease of decay, perifocal inflammation around the tuberculoma, bronchogenic insemination of the lung tissue surrounding the tuberculoma; stable — with the absence of radiological changes in the process of monitoring the patient or rare exacerbations without signs of tuberculoma increase; regressive, characterized by a slow reduction of the tuberculoma followed by the formation of a focus or a group of foci, an induration field or a combination of these changes in its place.

In the formation of chronic forms of tuberculosis, the following are of great importance: the reactivity of the organism, the virulence of MBT and their ability to form AB-resistant strains during treatment, the social characteristics of patients: (alcoholism, drug addiction, etc.), discontinuation of treatment.

Chronic forms of pulmonary tuberculosis are often an adverse consequence of infiltrative pulmonary tuberculosis. The course of caseous pneumonia in 95% of cases ends with the formation of chronic forms of tuberculosis.

Fibro-cavernous tuberculosis of the lungs is a secondary form of tuberculosis with the presence of significant fibrosis in the capsule of the cavern and in the surrounding lung tissue, as well as multiple foci of bronchogenic seeding. Clinically, this form of tuberculosis runs in waves with periods of exacerbation and remission or progresses steadily.

Characteristic: constant presence of symptoms of intoxication, formation of habitus phtisicus; physically - amphoric breathing over the cavity, a variety of wheezing, changes in the hemogram from the side of "red" and "white" blood, frequent bacterial excretion, formation of complications. This form of chronic pulmonary tuberculosis is the main cause of death in tuberculosis patients.

Cirrhotic tuberculosis of the lungs is characterized by the development of widespread fibrosis in the lungs and pleura, a violation of their functions while maintaining clinical and radiological signs of an active specific process.

X-ray signs of chronic tuberculosis: damage to one or both lungs, fibrosis of lung tissue, presence of thick-walled caverns, bronchiectasis, emphysema, presence of calcified foci, displacement of mediastinal organs to the affected side, reduction of the volume of the affected part of the lung. In the lower parts of the lungs, vessels of the lower lobe with a downward direction from the pulled roots ("weeping willow" symptom). Complications of chronic pulmonary tuberculosis: pulmonary hemoptysis, spontaneous pneumothorax, pulmonary vascular insufficiency, atelectasis, amyloidosis.

Questions for self-control.

1. Define the concept of "Primary tuberculosis".
2. Pathogenesis, pathology of primary tuberculosis.
3. Clinical forms of primary tuberculosis.
4. 0ability of epidanamnesis, clinic, objective examination in primary forms of tuberculosis.
5. Paraspecific reactions in primary tuberculosis.

6. Scheme of topography of intrathoracic lymph nodes according to V.A. Sukennikov
7. X-ray picture of tuberculosis of intrathoracic lymph nodes andprimary tuberculosis complex (stages).
8.Course of the primary tuberculosis complex, uncomplicated and complicated.
9. Define the concept of "Secondary tuberculosis".
10. Pathogenesis, pathology of secondary forms of tuberculosis.
11.What causes and factors are important in the development of chronic forms of pulmonary tuberculosis?12. Clinical manifestations of focal, disseminated, infiltrative tuberculosis,lung tuberculosis, caseous pneumonia.
13. Determination of X-ray changes in secondary forms of tuberculosis.
14. Complications of secondary forms of tuberculosis.

Indicative tasks for processing theoretical material.

Orientation map regarding the student's independent work with literature on the subject of the lesson.

No	Main tasks	Instructions	Answers
1	**Learn:** Etiology of tuberculosis	Name the types of pathogens tuberculosis is pathogenic for humans. Ways of penetration into the body.	
2	Pathogenesis of the primary tuberculosis	To determine the role of exo- and endogenous infection in the development of primary forms of tuberculosis, ways of spreading infections in the body.	
3.	Pathogenesis of the secondary tuberculosis	To determine the role of exo- and endogenous infection in the development of secondary forms of tuberculosis, ways of spreading infections in the body.	
4.	Pathanatomy	Name the types of pathological changes in the lungs and lymph nodes in primary forms of tuberculosis. Describe the shape of the tubercular tubercle.	
5.	Clinic	Make a list of clinical manifestations of the disease in dependence from the form of primary tuberculosis.	
5.	Consequences	Name the favorable and unfavorable consequences of primary tuberculosis.	
7.	Diagnosis	Give a list of the main methods of primary diagnosis tuberculosis	
8.	Possible complications	Give a list of complications of primary tuberculosis complex and tuberculosis of intrathoracic lymph nodes.	
9.	Treatment	Draw up a treatment plan for the patient.	

2.Practical works (tasks) to be performed.1. Examine a child or adult with tuberculosis. 2. Analyze laboratory data.
3.Read x-rays and tomograms. 4. Analyze the result of the tuberculin test.
5. Prescribe standard treatment regimens for primary and secondary forms of tuberculosis

3. Test tasks for self-control.

1. A child from a tuberculosis outbreak was admitted to the children's department of a tuberculosis hospital because of a primary tuberculosis complex. X-ray: on the right in the 2nd segment, a focus of shading of medium intensity 2x2 cm with indistinct edges, connected by a "track" to the root, enlarged basal lymph nodes on the right. Determine the stage of the primary tuberculosis complex.
A. Pneumonic
+V. Bipolarity (resorption) C. Sealing.

D. Calcification
E. Fibrotization

2.A 3-year-old child, while receiving specific therapy in a tuberculosis hospital for right-sided tumorous bronchoadenitis, developed shortness of breath, cyanosis, and increased dry cough. During X-ray control, the upper part on the right is shaded, reduced in volume, the organs of the mediastinum are shifted to the right. What complication did the child have?
A. Pneumonia
+V. Atelectasis
S. Apical pleurisy.
D. Miliary tuberculosis of the
lungs. E. Asbestosis of the lungs.

3.A 5-year-old girl fell ill a week ago. The mother notes poor appetite, irritability, rapid fatigue, dry cough, mainly at night, an increase in body temperature to 37.50 C. An objective examination revealed an increase in cervical, supraclavicular and axillary lymph nodes, hypertrichosis. Breathing is vesicular, heart sounds are clear. On the X-ray examination, the lung fields are transparent, there is intense darkening in the right root. No one in the family had tuberculosis, last year the Mantoux reaction was negative, this year it has not been done yet. What is the most likely clinical diagnosis for the child?
A.
Lymphogranulomatosis
B. Acute pneumonia
S. Tumor of the right main bronchus D.
Sarcoidosis
+E. Tuberculosis of intrathoracic lymph nodes

4.The patient is 16 years old. X-ray examination revealed a shadow of medium intensity without clear contours in the posterior segment of the right lung, which is connected to the root of the lung. On the tomogram, there is an increase in the tracheobronchial lymph nodes. In the blood analysis: Hb - 130 g/l, ESR - 30 mm/h, L - 5.3 g/l, lymphopenia, monocytosis. MBTs were not detected in sputum. What diagnosis most likely corresponds to the detected radiological changes?
A. Eosinophilic infiltrate B.
Peripheral lung cancer C.
Focal pneumonia
D. Sarcoidosis
+E. Primary tuberculosis complex

5.A 10-year-old child had a low-grade fever, decreased appetite, and rapid fatigue for 1.5 months. At the time of the examination, the Mantoux test with 2 TO was positive for the first time (papule - 12 mm). Enlarged peripheral lymph nodes in 6 groups of soft elastic consistency are palpated. X-ray changes of chest organs were not detected. What is the clinical form of tuberculosis in a child?
A. Tuberculosis of intrathoracic lymph nodes
+V. Tuberculosis intoxication S.
Viraj tuberculin test
D. Primary tuberculosis complex E.
Infection of MBT

6.Schoolboy, 13 years old. Got sick a month ago. A dry cough appeared, fatigue increased, appetite worsened, performance at school decreased. He has been registered for a tuberculin test for 8 months. Objectively: the skin is pale, the peripheral lymph nodes are enlarged to the size of beans, painless, soft. Mantoux test with 2 TO - infiltrate diameter

17 mm. Blood analysis: L - 10.0x10.9/l, ESR - 30 mm/h. On the X-ray of the lungs, the right root is expanded to 3 cm, the outer contour is blurred. What is the most likely diagnosis?
A. Sarcoidosis of intrathoracic lymph nodes B.
Primary tuberculosis complex
S. Tuberculous intoxication D.
Lymphogranulomatosis
+E. Tuberculous bronchoadenitis

7.A 14-year-old patient was admitted to the anti-tuberculosis hospital due to tuberculous bronchoadenitis. After 5 days, the condition worsened sharply: chest pain appeared on the right, shortness of breath, symptoms of intoxication increased. Percussion - dullness on the right from the 3rd rib to the bottom, there is also weakened breathing. What complication of tuberculous bronchoadenitis occurred in the patient?
A. Pleuropneumonia.
+ V. Pleurisy.
S. Atelectaz.
D. Broncho-nodular fistula.
E. Heart attack the lungs

8. A 9-year-old child was admitted to the children's department of the hospital with a diagnosis of "Tuberculosis of the intrathoracic lymph nodes in the infiltration phase." There is a history of tube contact. What chemotherapy drugs should be prescribed to the child?
A. Isoniazid + ethambutol + PASK + streptomycin
B. Isonifazid + streptomycin + tibon + ethambutol
C. Rifampicin + PASK + isoniazid + ethambutol D.
Phtivazid + tibon + kanamycin
+E. Isoniazid + rifampicin + pyrazinamide + ethambutol

4.Individual tasks for students of higher education on the topic
Topics of reports/abstracts:
- differential diagnosis of the primary tuberculosis complex
unspecific pneumonia
- differential diagnosis of tubintoxicity with helminthiasis, rheumatism, tonsillitis
- differential diagnosis of tuberculosis of intrathoracic lymph nodes with lymphogranulomatosis and nonspecific adenopathies: measles, whooping cough, viral infections.

5. List of recommended literature (main, additional, electronic information resources):
Main:
1. Phthysiatry: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others] ; under the editorship V. I. Petrenko. Kyiv: Medicine, 2018. 471 p.
2. Current issues of phthisiology: manual / D. G. Kryzhanoskyi, V. A. Freiwald, N. A. Marchenko (and others). Dnipropetrovsk: T. K. Serednyak, 2017. 155 p.
3. Phthisiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. Kharkiv: KhNMU, 2016. 176 p.
Additional:
1. Prevention of tuberculosis. Study guide for students and interns of VNMZ IV accreditation level and doctors / V. I. Petrenko, M. G. Dolynska, A. V. Aleksandrin, V. V. Petrenko. Kyiv: 2 Print, 2017. 88 p. URL:http://tb.ucdc.gov.ua/uploads/files/prophilaktica.pdf.
2. Biochemical Value Dynamics in Patients with Multidrug-Resistant Tuberculosis/HIV with CD4+ Lymphocyte Cells below 50 Cells/μCLandits Variability in the Application of Adjuvant

Immunoglobulin Therapy / NA Matsegora, AV Kaprosh, PB Antonenko // International Journal of Mycobacteriology. 2019; 8 (4):374 - 380. (SCOPUS)
3. Global tuberculosis report 2019 (WHO/CDS/TB/2019.15). Geneva, World Health Organization. 2019 URL: https://apps.who.int/iris/bitstream/handle/10665/329368/9789241565714-eng.pdf
4. Order of the Ministry of Health of Ukraine No. 530 dated 25.02.2020 "Health care standards for tuberculosis". URL:
https://phc.org.ua/sites/default/files/users/user90/Nakaz_MOZ_vid_25.02.2020_530_Standarty_medopomogy_pry_TB.pdf
5. UBERCULOSIS Clinical guideline of the Ministry of Health of Ukraine, based on evidence No. KH 2021-530 dated 11/17/2021. URL: https:///www.dec.gov.ua/mtd/tuberkuloz/
6. Order of the Ministry of Health of Ukraine No. 287 dated February 1, 2019 "On the approval of the Infection Control Standard for health care institutions that provide assistance to tuberculosis patients." URL: https://zakon.rada.gov.ua/laws/show/z0408-19#Text
Electronic information resources
1. Website of the Public Health Center of the Ministry of Health of Ukraine.http://phc.org.ua/
2. Tuberculosis issues on the WHO website.http://www.who.int/tb/en/
3. National Tuberculosis Resource Center.http://tb.ucdc.gov.ua/
4. www.dec.gov.ua/mtd/dodatki/2016_729_VGC/2016_729_YKPMD_VGC.doc
5. http://www.ifp.kiev.ua/doc/people/tubzar.htm

Topic 7.

Complications of pulmonary tuberculosis. Tuberculosis of the mucous membrane of the oral cavity and jaw bones. Clinical analysis of patients.

Goal. Get acquainted with the pathogenesis of tuberculosis of the oral cavity and maxillofacial area, features of their course at the modern stage, diagnostic methods, causes of complications and their prevention.

Basic concepts: pathogenesis of tuberculosis of the oral cavity and maxillofacial area, features of their course at the present stage, diagnostic methods, causes of complications and their prevention; pathogenesis, pathomorphosis, features of the clinical course, complications of pulmonary tuberculosis and treatment of patients with these complications.

Plan

1. Theoretical questions:

Primary lesions of the mucous membrane of the oral cavity, tongue, larynx and cervical lymph nodes are rare. More often, tuberculosis of the oral cavity, larynx, peripheral lymph nodes occurs as a secondary lesion against the background of tuberculosis of the skin, lungs, etc.

Three forms of tuberculosis of the oral cavity are observed: tuberculous lupus, miliary-ulcerative tuberculosis and its collicative form, which is not very common. On the mucous membrane of the oral cavity, tuberculosis manifests itself mainly secondarily.

Primary tuberculosis of the mucous membrane of the oral cavity practically does not occur, because the mucous membrane of the oral cavity is not conducive to

mycobacterium tuberculosis, although the results of research indicate that even an intact woman can become infected by contact with mycobacterium tuberculosis. The emergence of a primary tuberculosis complex on the mucous membrane of the oral cavity is possible in children at the site of invasion of the pathogen. In this case, a painful ulcer of 10–15 mm in size appears, with pitted uneven edges and a dirty gray bottom. It is accompanied by regional lymphadenitis.

After 3-5 weeks, the ulcer gradually disappears, even without treatment.

More often, tuberculosis of the mucous membrane of the oral cavity occurs as a secondary lesion against the background of tuberculosis of the lungs and other organs.

Tuberculosis of the oral cavity is observed in the form of the following forms: tuberculous lupus, miliary-ulcerative and colliquative tuberculosis.

Tuberculous lupus (Lupus vulgaris).

It is the most common form of secondary tuberculous lesions of the maxillofacial area. The main primary element of tuberculous lesions of the mucous membrane of the oral cavity is a lipoma - a specific tubercular tubercle (tuberculum) of red or yellow-red color, soft consistency, 1–3 mm in diameter. Lipomas are arranged in groups: fresh on the periphery, and those located in the center are prone to cheesy decay and fusion with neighboring bumps. At the same time, shallow ulcers are formed with soft uneven, pitted, swollen, slightly painful edges, lined with bright red or yellow-red papillomatous crimson growths, which bleed easily and are covered with a clear or yellowish coating.

Tuberculous lupus progresses slowly and passes through the infiltrative, tubercular, ulcerative and scar stages.

Lesions from tuberculous lupus are located mainly on the skin of the face (in the form of a "butterfly"), spreading to the upper lip, red border, less often - to the mucous membrane of the gums and alveolar sheath of the upper jaw in the area of the front teeth, hard and soft palate, upper lip and cheeks, where the lesion is represented by an ulcer of an irregular shape with pitted edges and a bottom with bleeding granulations.

Sometimes the process is localized only on the red border. The lip increases in volume due to swelling, becomes dense, cracks and ulcers appear on it, which are covered with bloody and purulent crusts.

According to the location on the mucous membrane of the gums, I.H. Lukomsky distinguishes 4 types of lesions in tuberculosis.

1. *Marginal*. Covers the gingival margin first in the form of infiltration, then turns into a bumpy-erosive form. The mucous membrane of the gums acquires a bright red color, the gingival margin and interdental papillae swell sharply, the contours of the gingival margin are smoothed, the gums seem to be pricked by pins, painful. Matte shade, bleeds easily.

2. *Supramarginal*infiltrative or tuberous-ulcerative lesion that does not extend to the edge of the gums. At the place of scars, which remain as a result of the healing of ulcers, new lipomas appear, and then ulcers of an irregular shape with a bottom covered with a grayish-yellow coating.

If the process is localized on the lip, it becomes dense, cracks and ulcers appear on it, which are covered with bloody and purulent crusts.

3. *Total*. Sometimes the entire gum surface is involved in the process. It has an infiltrative, more often - erosive or ulcerative character. At the same time, the bone tissue of the alveolar process is quite often affected, the teeth become mobile and fall out, may develop

picture of "hypertrophic lupus gingivitis". Regional lymph nodes are enlarged and thickened.

4. *Bilateral*. It develops as ulcerative lupus, in which there is often a combined lesion of the gums, palate, tongue and lips with the typical dynamics of a tubercular lesion: nodules → decay → scar.

Diagnosis of the disease is facilitated by the presence of "apple jelly" symptoms typical of tuberculous lupus (with diascopy) and probe failure.

When pressing with a glass slide on the skin or the red border of the lips, the affected tissue bleeds and lipomas in the form of yellow-brown nodules become clearly visible (resembling apple jelly), and when pressing with a button probe on the tubercle, the probe falls into the lipoma - Pospelov's phenomenon, test with a probe.

Regional lymph nodes increase in size, become dense, and become lumpy bundles. Tuberculin tests are usually positive. Tuberculosis mycobacteria are rarely found.

Pathological examination reveals typical tuberculous nodules with epithelioid cells, Pirogov-Langhans giant cells, and peripheral lymphocytes. Caseous necrosis is weakly expressed or absent at all. The inflammatory infiltrate consists of lymphocytes and plasma cells.

Tuberculous lupus is distinguished by:

- with tuberous lesions in primary syphilis (in which the tubercles are dense and, unlike tuberculous lupus, never re-form on scars, Pospelov's symptom is negative);
- with leprosy;
- with lupus erythematosus.

The latter is characterized by the absence of lupus, but the presence of erythema, hyperkeratosis, and cicatricial atrophy.

Treatment is carried out with a combination of anti-tuberculosis drugs

anti-tuberculosis institutions.

Local treatment:

1. Getting rid of local traumatizing factors.
2. Sanitation of the oral cavity.
3. Application with antiseptics and anti-inflammatory drugs.

Miliary-ulcerative tuberculosis(tuberculosis miliaris ulcerosa) is a variant of secondary tuberculous lesion of the mucous membrane of the oral cavity, which develops against the background of decreased reactivity.

Tuberculosis mycobacteria, which are secreted in significant quantities with sputum, with a severe progressive course of the pulmonary process, from open foci of infection (more often from caverns) take root in the mucous membrane (usually in places of injuries) of the cheeks along the line of closure of the teeth, back and lateral surfaces of the tongue, soft palate. At the same time, typical tuberculous tubercles appear, the further development of which is accompanied by disintegration in the center and the formation of a shallow, initially small, with uneven undercut soft edges, very painful ulcer, which has a creeping character and grows along the periphery. Sometimes it reaches large sizes. The bottom and edges of the ulcer have a granular character (due to the tubercles), covered with a yellow-gray coating. The tissues surrounding the ulcer are swollen. On the periphery of the ulcer surface, it is possible to detect small abscesses, so-called grains or bodies of Trel.

In the case of a long-term existence of an ulcer, a secondary infection joins and its edges and bottom become dense. On the tongue and transitional folds, ulcers have the form of slits with inwardly turned edges. Lymph nodes may not be palpable at the beginning of the ulcer, but later increase in size, become dense and elastic, and painful.

The presence of intoxication syndrome, the detection by cytological examination among the inflammatory elements of Pirogov-Langhans giant cells and epithelioid cells, mycobacterium tuberculosis help to confirm the tuberculous etiology of the process.

Miliary-ulcerative tuberculosis should be differentiated from traumatic, decubitus, and trophic ulcers of the oral mucosa, erosions and ulcers when secondary syphilis rashes are complicated by secondary infection, gummy ulcers in tertiary syphilis, as well as Vincent's stomatitis and cancer of the oral mucosa.

Colicative tuberculosis(scrofuloderma) is a rarer form of secondary tuberculosis, occurs mainly in children. A typical sign of this form is the formation of nodes in the deep layers of the mucous membrane, which eventually disintegrate. At the same time, ulcers of an irregular shape, soft consistency, with eaten, pitted edges and flaccid granulations at the bottom appear. The ulcer is not painful, when it heals, uneven, so-called shaggy scars are formed.

The colicative form of tuberculosis of the mucous membrane of the oral cavity should be differentiated from a gum ulcer, the bottom of which also contains granulations. However, its edges are crater-like, sticky, painless. After the ulcer heals, a retracted star-shaped scar remains. Nodes in the case of actinomycosis are characterized by a sharp board-like stickiness, the presence of fistulas, in the secretions of which drusen of the ray fungus are found.

Cancerous ulcers occur in adulthood and are characterized by stickiness, tenderness, everted edges and the presence of atypical cells during cytological examination.

Treatment of tuberculosis of the mucous membrane of the oral cavity is carried out by a dentist against the background of general therapy prescribed by a phthisiologist.

Sanitation of the oral cavity, elimination of traumatizing factors, treatment of teeth, periodontal pathology is a prerequisite for local therapy of tuberculous lesions of the mucous membrane of the oral cavity. Antiseptic, necrolytic agents, specific anti-tuberculosis drugs and agents that improve the reparative properties of tissues are used.

Questions for self-control.

1. Pathogenesis, pathology of tuberculosis of the oral cavity and maxillofacial region.
2. Clinical forms of tuberculosis of the oral cavity and maxillofacial region.
3. 0ability of epidanamnesis, clinic, objective examination for tuberculosis of the oral cavity and maxillofacial region.
4. X-ray tuberculosis of the jaw.
5. The course of tuberculosis of the oral cavity and maxillofacial region.
6. Complications of tuberculosis of the oral cavity and maxillofacial area.

Indicative tasks for processing theoretical material.

0 orientation map regarding the student's independent work with literature on the subject of the lesson.

No	Main tasks	Instructions	Answers
1	**Learn:**Etiology of tuberculosis	Name the types of the causative agent of tuberculosis that are pathogenic for humans. Ways of penetration into the body.	

2	Pathogenesis secondary tuberculosis	Determine the role of exo- and endogenous infection in development of secondary forms tuberculosis,ways of spreading infection in the body.	
3.	Pathogenesis of tuberculosis of the oral cavityand jaw-facial area	To determine the role of exogenous and endogenous infection in the development of tuberculosis of the oral cavity and maxillofacial region, the ways of spreading the infection in the body.	
4.	Pathanatomy	Name the types of pathological anatomical changes lungs in small forms tuberculosisDescribe the shape of the tubercular tubercle.	
5.	Clinic	Make a clinical list manifestations diseases depending on the form of tuberculosis.	
5.	Consequences	Name the favorable and unfavorable consequences of small forms of tuberculosis and the development of oral cavity and maxillofacial tuberculosis region	
7.	Diagnosis	Give a list of the main diagnostic methods tuberculosis	

2. Practical works (tasks) to be performed.

List of educational practical tasks:
1. Examine a patient for tuberculosis.
2. Analyze laboratory data.
3. Read x-rays and tomograms.
4. Analyze the result of the tuberculin test.

3. Test tasks for self-control.

1. Small forms of tuberculosis include: A.
Caseous pneumonia
V. Tuberculoma
C. Primary tuberculosis complex D.
Cirrhotic tuberculosis of the lungs
E. Nothingfrom the above (Reg. resp. IN).

2. Secondary forms of tuberculosis include: A.
Tuberculosis intoxication
B. Infiltrative
S. Primary tuberculosis complex
D. Tuberculosis of the intrathoracic lymph nodes. E.
Nothinglisted (Reg. resp. IN).

3.Tuberculosis of the oral cavity includes: A.
Scrofuloderma
B. Miliary-ulcerative tuberculosis C.
Tuberculous lupus
D. Primary tuberculosis complex of the oral cavity E.

Everythingthe above (Reg. resp. IS)

4.How many stages of tuberculous lupus are distinguished:
A.4
B.2
P.5
D.3
E.6 (Reg. resp. AND)

Task 1. You were invited to the house of a patient with destructive pulmonary tuberculosis due to pulmonary bleeding (more than 500 ml of blood was released).
a) what immediate help will you provide him, if you do not have any medicines? b) what is the most certain mechanism of such bleeding?
c) your further tactics.
Answer standard:
a) put a tourniquet on the limbs.
b) rupture of blood vessels.
c) to cause immediate
ambulance for further treatment and delivery to a hospital

Task 2. You were invited to a patient who complains of pain in the left side associated with the act of breathing, which appeared suddenly. Percussion over the left lung – a tympanic tone of the lung sound, auscultation – sharply weakened breathing.
a) name the disease in which similar complaints can be observed.
b) name the signs on the basis of which spontaneous pneumothorax can be suspected here.
c) mark the plan for further examination of the patient to clarify the diagnosis and determine the type of SP
Answer standard:
a) pleurisy, intercostal neuralgia, spontaneous pneumothorax. b)
tympanitis on percussion, sharply weakened breathing.
c) X-ray of OGK.

Task 3. A patient with fibrous-cavernous tuberculosis of the lungs, MBT(+), was brought to the hospital with complaints of shortness of breath at rest, edema. Objectively: cyanosis, edema on the lower extremities, the liver is 4 cm lower than the costal arch. Above the lungs on both sides, medium-bubble wet rales. Pulse - 100 beats/min., blood pressure - 115/80 mm Hg, the borders of the heart are enlarged. What complication of tuberculosis do you suspect.
Answer: chronic pulmonary heart.

4. Individual tasks for students of higher education on the topic4.
Topics of reports/abstracts:
- modern laboratory methods of diagnosis of tuberculosis
- modern instrumental methods of diagnosis of tuberculosis
- complications of tuberculosis of the oral cavity and maxillofacial area.

5. List of recommended literature (main, additional, electronic information resources):

Main:

1Physiatrics: a textbook / V. I. Petrenko, L. D. Todoriko, L. A. Hryshchuk [and others]; under the editorship

V. I. Petrenko. Kyiv: Medicine, 2018. 471p.
2Current issues of phthisiology: manual / D. G. Kryzhanoskyi, V. A. Freiwald, N. A. Marchenko (and others). Dnipropetrovsk: T.K. Serednyak, 2017. 155p.
3Phthysiology in diagrams, tables and drawings: educational method. manual / O. S. Shevchenko, O. I. Choporova, S. L. Matveeva, etc. Kharkiv: KhNMU, 2016. 176 p.

Additional:

1 Prevention of tuberculosis. Study guide for students and interns of VNMZ IV accreditation level and doctors / V. I. Petrenko, M. G. Dolynska, A. V. Aleksandrin, V. V. Petrenko. Kyiv: 2 Print, 2017. 88 p. url:http://tb.ucdc.gov.ua/uploads/files/prophilaktica.pdf.
2Emergencies in the practice of a phthisiopulmonologist: teaching. manual / N. A. Matsegora, O. Ya. Lekan, O. A. Baburina, M. Yu. Golubenko. Odesa: "Astroprint", 2016. 64 p.
3 Tuberculosis of bones and joints: method. recommendations for students and interns of VNMZ IV level of accreditation / N. A. Matsegora, O. Ya. Lekan, L. P. Omelyan [and others]. Odesa: ONMedU, 2018. 24 p.
4Extrapulmonary and miliary tuberculosis in patients with TB/HIV co-infection / V. I. Petrenko, M. G. Dolynska, O. M. Raznatovska. K. 2015: DCS Center. 112 p. URL:http://tb.ucdc.gov.ua/uploads/files/usaid_170x240_fp_new.pdf
4Global tuberculosis report 2019 (WHO/CDS/TB/2019.15). Geneva, World Health Organization. 2019 URL:https://apps.who.int/iris/bitstream/handle/10665/329368/9789241565714-eng.pdf
6 Order of the Ministry of Health of Ukraine No. 530 dated February 25, 2020 "Health care standards for tuberculosis". URL:https://phc.org.ua/sites/default/files/users/user90/Nakaz_MOZ_vid_25.02.202 0_530_Standarty_medopomogy_pry_TB.pdf
7 TUBERCULOSIS Clinical guidelines of the Ministry of Health of Ukraine, based on evidenceNo. KN 2021-530from11/17/2021.URL: https://www.dec.gov.ua/mtd/tuberkuloz/
8 Order of the Ministry of Health of Ukraine No. 287 dated February 1, 2019 "On the approval of the Infection Control Standard for health care institutions that provide assistance to tuberculosis patients." URL:https://zakon.rada.gov.ua/laws/show/z0408-19#Text

Electronic information resources

1Website of the Public Health Center of the Ministry of Health of Ukraine.http://phc.org.ua/2 Tuberculosis issues on the WHO website.http://www.who.int/tb/en/ 3National Tuberculosis Resource Center.http://tb.ucdc.gov.ua/