Approved

At the meeting of Faculty of Medicine II
Minutes no ___of _____

Dean of Faculty of Medicine II
Assoc. prof., PhD _____ M. Betiu

Approved

At the meeting of Department of Pneumophthisiology
Minutes no 12 of 12 March 2014

Head of Department of Pneumophthisiology
Prof., PhD _____ C. Iavorschi

SYLLABUS FOR STUDENTS OF FACULTY OF MEDICINE NO.2

Name of the course: **Pneumophthisiology**

Code of the course: **S.07.O.51**

Type of course: **Compulsory**

Total number of hours – 40

Lectures - 10 hours, practical lessons - 30 hours

Number of credits provided for the course: **2**

Lecturers who teach the course:
Iavorschii Constantin – PhD, professor
Kulcitkaia Stela – PhD, associate professor
Ustian Aurelia – PhD, associate professor
Niguleanu Adriana - PhD, lecturer
Vilc Valentina – MPH, lecturer

Chisinau 2014

I. Aim of the discipline

The purpose of training students in pneumophthiziology takes account for the future medical professional activity and involves acquiring basic knowledge and training on respiratory tuberculosis practical skills needed to perform the diagnosis and treatment of patients with respiratory tuberculosis.

***II.** Training objectives in the discipline of Pneumophthisiology*

- At the level of knowledge and understanding

- to define the theoretical basis of respiratory tuberculosis at contemporary;
- to understand the importance of respiratory tuberculosis studying, especially in the current epidemiological conditions;
- to identify particularities of primary tuberculosis in children, adolescents and adults;
- to know the etiopathogenesis, clinical manifestations, diagnosis and differential diagnosis, principles of treatment and prevention of various forms of respiratory tuberculosis;
- to identify the risk of TB contracting.

- At the level of application

- to achieve practically all mandatory stages of the formulation of diagnosis: history, physical examination, interpretation of clinical data (formulation of the clinical diagnosis), indication and interpretation of investigations, formulation of diagnosis;
- to learn application method of Pr. Mantu with 2UT and results interpretation;
- to interpret the chest radiographs with different forms of Extrarespiratory tuberculosis;
- to perform differential diagnosis of tuberculosis with other respiratory diseases;
- to apply TB treatment according to tuberculosis cases and type of resistance;
- to take the optimal decisions of the emergency aid in critical situations;
- to apply prevention methods of tuberculosis in practice;
- to formulate ethical and deontological principles in health care of patients with tuberculosis;

- to resolve issues, multilateral and critical processing assimilated information.

- At the level of integration

- to appreciate the importance of studying of Pneumophthisiology in context of therapy and integration of related medical disciplines;
- creatively tackle problems of clinical medicine;
- to infer interrelationships between Pneumophthisiology and other clinical disciplines;
- to possess the skills of implementation and integration of knowledges obtained in medical practice;
- to be able to objectively assess and self-assess knowledge in the field;
- to be able to assimilate the achievements in Pneumophthisiology

III. Provisional terms and conditions:

Pneumophtisiology is a clinical discipline in Internal Medicine, studying of which at the university will allow future physician to assimilate the principles of management of respiratory tuberculosis in patients. Respiratory tuberculosis has interdisciplinary closely touches in the undergraduate medical curriculum. So, knowledge of Pneumophthisiology contributes to the formation of the holistic health concept and complex application skills.
To acquire Pneumophthisiology better knowledge in the following subjects is required:

- ✓ **Fundamental:** Human Anatomy, Histology, Cytology and Embryology, Physiology and Medical Rehabilitation, Biochemistry and Clinical Biochemistry, Molecular Biology and Human Genetics, Microbiology, Virology and Immunology;
- ✓ **Preclinical:** Pathophysiology and clinical pathophysiology, Morphopathology, Pharmacology and Clinical Pharmacology, Internal Medicine - semiology, Surgery - semiology, Pediatrics, semiology and childcare;
- ✓ **Clinical:** Internal Medicine, Obstetrics and Gynecology, Surgery, Pediatrics, Urology, Neurology, Ophthalmology, Otorhinolaryngology, Dermatovenereology, Endocrinology, Hematology and Oncology, Infectious Diseases, Epidemiology.

IV. Basic content of the course

1.THEORETICAL BASIS OF PHTHISIATRY

1.1. Epidemiology of tuberculosis. Endemia of tuberculosis and evaluation of its epidemiometric indicators. Current situation and characteristics of TB endemia worldwide and in Moldova. Epidemiological chain. Natural history of tuberculosis in the population.

1.2. Etiology of tuberculosis. Genus Mycobacterium. Classification. Biochemical structure. Microscopic morphology. Development on the culture media. Natural resistance to the physical and chemical agents. Primary chemoresistance. Secondary chemoresistance.

1.3. Transmission of TB infection. Sources of infection. Pathways of infection penetration in the body and mechanisms of contamination.

1.4. Host body's reaction to a tuberculosis infection. Experimental Tuberculosis. Koch phenomenon. Mechanism of the immune response. Tuberculin reaction. Protective immunity. The relationship hypersensitivity - immunity.

1.5. Pathogenesis of tuberculosis. Stages of TB pathogenesis. Morphopathology of tuberculosis.

1.6. Evolution of TB infection. Role of the environmental factors. Cycle of the TB infection in humans. Infection and disease.

2. METHODS OF TUBERCULOSIS SCREENING AND DIAGNOSIS

2.1. Detection of TB. Passive way - examination of a sugestive person. Active method: examination of the risc groups, examination of the dangerous groups. Epidemiological investigation spun. Algorithm of TB diagnosis.

2.2. Diagnosis of tuberculosis. Medical history. Clinical evaluation of the suspect patient. Implementation and critical evaluation of complementary examinations. Inpatient hospital medical records, rules for filling.

2.3. Microbiological examination. The importance of microbiological investigations in the diagnosis of tuberculosis. General principles and methods of harvesting, transportation and keeping of the pathological products. Microscopical examination. Bacteriological examination (examination by culture). Growing of mycobacteria on the liquid media (BACTEC, MB / BacT). Molecular genetic methods of diagnosis and identification of species of *Mycobacteria tuberculosis* (polymerase chain reaction, GenoType®MTBDRplus, XpertMTB/RIF, BD ProbeTec™, "fingerpriting", spoligotyping). Results interpretation. Susceptibility testing methods of *M. tuberculosis*.

2.4. Tuberculin skin test. Tuberculin. Types of tuberculin. Purposes of tuberculin test using. Advantages and disadvantages of tuberculin test. Technique of IDR Mantoux test with 2 UT. Evolution of Mantoux test. Body's reaction to tuberculin. Interpretation of the tuberculinic reactions. Convertion tuberculinic test. Booster effect.

2.5. Imaging elements of tuberculosis diagnostic. Value and place of radiological examination in the diagnosis of pulmonary tuberculosis. Techniques and methods. Possibilities and limits. Normal radiological anatomy of the lungs and hilar region. Radiological semiology of respiratory tuberculosis. (Basic radiological changes in pulmonary TB). Interpretation of pathological opacity in pulmonary tuberculosis. Computed tomography (CT). Nuclear magnetic resonance (NMR). Ultrasound examination.

2.6. Respiratory functional explorations. Respiratory pathophysiology of pulmonary tuberculosis. Spirometry. Pletizmografy. Gasometry. Perfusion scintigraphy. Results interpretation of functional examinations.

2.7. Laboratory investigations. Biochemical and immunological investigation. Examination of liver function. Examination of kidney function. Cytological examination of pleural effusion. Biochemical examination of cerebral spinal fluid. Results interpretation.

2.8. Bronchoscopy in diagnosis of tuberculosis. Indications for bronchoscopy. Bronchoscopy technique. Pathological endoscopical semiology. Endoscopic aspects of the specific bronchopulmonary

pathology. Bronchoscopic harvesting methods. Bronchoalveolar lavage (LBA).

2.9. Biopsy in the diagnosis of tuberculosis. Indications for biopsy. Methods of biopsy. Histological aspect of tuberculosis. Histological appearance of lung cancer. Histological appearance of nonspecific inflammation

3. CLINICAL FORMS OF RESPIRATORY TUBERCULOSIS

3.1. Clinical classification of tuberculosis. Basic principles of classification. Compartments. Clinical forms of pulmonary TB. Extrapulmonary tuberculosis. Characteristic of tuberculosis process. Phases of tuberculosis. Complications of tuberculosis. Posttuberculoase sequelae. Elements of diagnosis formulation based on the classification.

3.2. Primary tuberculosis. Primary Tuberculosis complex. General peculiarities of primary tuberculosis. Pathogenesis. Primary latent tuberculosis infection. Morphopathology of primary TB complex. Positive and differential diagnostic. Treatment and prognosis.

3.3. Tuberculosis of intrathoracic lymph nodes. Pathogenesis. Morphopathology. Clinical forms. Symptoms and evolution. Complications. Positive and differential diagnosis. Treatment. Tuberculosis sequelae of primary infection. Epidemiological significance of posttuberculoase sequelae.

3.4. Disseminated pulmonary tuberculosis. Pathogenesis. Clinical forms. Pathological anatomy. Miliary tuberculosis. Subacute and chronic disseminated pulmonary tuberculosis. Symptoms and evolution. Radiological signs. Positive and differential diagnosis. Treatment.

3.5. Nodular pulmonary tuberculosis. Pathogenesis. Symptoms, evolution and prognosis. Appreciation of specific activity of nodular pulmonary tuberculosis. Positive and differential diagnosis. Treatment.

3.6. Infiltrative pulmonary tuberculosis. Pathogenesis. Clinical and radiographic types of tuberculosis infiltrates. Particularities of

evolution. Symptoms and prognosis. Positive and differential diagnosis. Treatment. Caseous pneumonia.

3.7. Fibro-cavitary pulmonary tuberculosis. Pathogenesis. Contributing factors. Clinical and radiological characteristics. Evolution and prognosis. Complications. Differential diagnosis. Treatment.

3.8. Tuberculous pleurisy. Pathogenesis. Classification. Clinical and radiological symptoms. Indications and methods of thoracentesis. Pleural fluid examination. Differential diagnosis. Evolution and treatment. Tuberculosis empyema.

3.9. Tuberculosis of the bronchi. Pathogenesis. Clinical forms and location. Correlation with localisation of pulmonary tuberculosis. Clinical manifestafion of bronchial tuberculosis. Clinical manifestafion of laryngeal tuberculosis. Differential diagnosis. Evolution, treatment.

4. COMPLICATIONS OF RESPIRATORY TUBERCULOSIS AND MEDICAL EMERGENCY

4.1. Pulmonary hemorrhage. Pathogenesis. Classification. Symptoms. Positive and differential diagnosis. Therapeutical treatment. Indications for surgical intervention.

4.2. Spontaneous pneumothorax. Pathogenesis. Clinical and radiological picture. Evolution. Positive and differential diagnostic. Complications. Therapeutical treatment. Surgical treatment.

5. TUBERCULOSIS ASSOCIATED WITH OTHER DISEASE AND CONDITIONS

5.1. Pulmonary tuberculosis and nonspecific diseases of the respiratory system. Pathogenesis. Clinical forms. Clinical and radiological symptoms. Positive and differential diagnostic. Evolution, treatment and prevention.

5.2. **Pulmonary tuberculosis and diabetes mellitus.** Pathogenesis. Correlation tuberculosis and diabetes. Symptoms, evolution and prognosis. Particularities of treatment and prophylaxis.

5.3. **Pulmonary tuberculosis and ulcer disease.** Pathogenesis. Clinical and treatment particularities. Evolution and prognosis. Supervision and dispensarization of patients.

5.4. **Pulmonary tuberculosis and alcoholism.** Social and epidemiological aspects. Pathogenesis. Classification. Clinical and morphological particularities. Methods of diagnosis. Differential diagnosis. Principles of treatment. Evolution and prognosis.

5.5. **Tuberculosis and HIV infection.** Epidemiology. Correlation between AIDS and tuberculosis. Clinical and radiological particularities of tuberculosis in patients with HIV / AIDS. Detection and diagnosis of tuberculosis in patient with HIV / AIDS. Detection and diagnosis of HIV / AIDS patient with tuberculosis. Particularities of anti-tuberculosis therapy in patients with AIDS and tuberculosis.

5.6. **Tuberculosis and pregnancy.** Tuberculosis and heredity. Characteristics of the pathogenesis and clinical manifestations. Evolution, treatment and prognosis. Medical indications for interrupting of pregnancy. Obstetric care. Prevention of tuberculosis in newborn.

6. THE TREATMENT OF TUBERCULOSIS

6.1. **Antituberculosis drugs.** Classification of anti tuberculosis drugs. The pharmacological activity of first- and second-line anti-tuberculosis drugs. The side-effects of antituberculosis drugs, classification. The mode of action. Interaction with other drugs. New antituberculosis drugs.

6.2. **Chemotherapy.** Aims of treatment. General principles of treatment. Regimens. DOTS classic TB treatment: basic principles, schemes. Categories of patients in strategy DOTS.

6.3. **Treatment monitoring** and evaluation of results of TB treatment.

6.4. **Treatment of drug-resistant TB**. Treatment of multidrugresistant tuberculosis (MDR TB): standardized and individually regimen. Treatment of patients with mono- and poli-resistant tuberculosis. Conduct XDR TB patient.

6.5. **Communication, information and education of a patient with TB.** The importance of health education in tuberculosis control. The importance of the patient's adherence to the treatment.

6.6. **Adjunctive therapy.**

7. PREVENTION OF TUBERCULOSIS

7.1. **BCG Vaccination and revaccination.** Immunogenesis and vaccine protection. Definition of BCG vaccine. Indications and contraindications to vaccination and revaccination. BCG vaccination and revaccination technique. Evolution of post-vaccination reactions. Post-BCG complications and their classification. Causes of development and their prevention methods. Experimental, new vaccines.

7.2. **Drug prophylaxis of tuberculosis.** Primary prevention (chemoprophylaxis). Secondary prophylaxis (preventive chemotherapy). Indications. Methodology.

7.3. **Tuberculous focus.** Criteria of TB foci formation. Classification of TB foci. Activities in focus of tuberculosis. Recovery of tuberculous focus. Epidemiological investigation. Collaboration phthisiopneumology service and public health.

7.4. **Control of tuberculosis infection.** Managerial activities. Administrative control. Environmental control measures. Personal respiratory protection.

8. ORGANIZATION OF TUBERCULOSIS CONTROL IN THE REPUBLIC OF MOLDOVA

8.1. **National Programme of Tuberculosis Control**. Purpose and objectives.

8.2. Organizational structure and responsibilities of TB control services. Central level. Regional / city level. Primary level. TB control in primary health care level. Joint activities between the centers of public health, primary care medicine and phthisiopneumology service in TB control.

A. Lectures:

No.	Topic	Hours
1.	History of tuberculosis, epidemiology, etiology and pathogenesis of tuberculosis.	**2**
2.	Detection of TB. Methods of examination of TB patients. Treatment of tuberculosis. Strategies DOTS and DOTS-Plus.	**2**
3.	Primary latent tuberculous infection. Particularities of primary tuberculosis. Primary tuberculosis complex. Tuberculosis of intrathoracic lymph nodes. Complications of primary tuberculosis.	**2**
4.	Secondary pulmonary tuberculosis (disseminated, nodular, infiltrative, fibro-cavitary). Clinical particularities, differential diagnosis.	**2**
5.	Prevention of tuberculosis: specific, sanitary, social. TB infection control. Organization of tuberculosis control in RM.	**2**
	Total	**10**

B. Practical Lessons:

No.	Topic	Hours
1.	Appropriation particularities and methods of examination of TB patient: clinical and paraclinical investigation. Classification of TB. Tuberculin skin test. Microbiological and radiological examination. Ispection of the patient.	**6**
2.	Examination and results evaluation of patients with primary tuberculosis. Diagnosis and treatment. Clinical discussion of patients with primary tuberculosis complex, tuberculosis of intrathoracic lymph node. Complications of primary tuberculosis: pleurisy, meningitis, atelectasis.	**6**
3.	Examination and evaluation of results of patients with secondary pulmonary tuberculosis (disseminated TB, nodular TB). Diagnosis and treatment. Clinical discussion of patients with secondary pulmonary tuberculosis.	**6**
4.	Examination and evaluation results of patients with secondary pulmonary tuberculosis (infiltrative TB, fibro-cavitary TB).	**6**

	Diagnosis and treatment. Clinical discussion of patients with secondary pulmonary tuberculosis.	
5.	Prevention of tuberculosis. Criteria of TB foci formation. Activities in tuberculous focus. Recovery of tuberculous focus. Epidemiological investigation. TB infection control. TB control in primary health care level. Joint activities between the centers of public health, primary care medicine and phthisiopneumology services in TB control.	**6**
	Colloquium	
	Total	**30**

V. *Recommended literature:*

- A. Compulsory:

- Guide Pneumophthisiology. Chisinau, 2008
- Guide Phthisiology. Chisinau, 2011
- Tuberculosis in children. National Clinical Protocol. Chisinau, 2012
- Tuberculosis in adult. National Clinical Protocol. Chisinau, 2012
- Nadia Ait-Khaled, Donald A. Enarson. Tuberculosis. A Manual for Medical Students. WHO, 2003

- B. Additional:

- Bumbăcea D. et al. - Tuberculosis. Course for students. Romania, 2005
- Guidelines for the diagnosis and treatment of tuberculosis in children. Bucharest, 2005
- Perelman MI, Bogadelnikova I.V. Phthisiology. Moscow, 2010
- National Programme for Prevention and Control of Tuberculosis 2011 – 2015
- Methodical teaching materials, legislative norms, specialized periodicals publications.
- Robert Gie. Diagnostic atlas of intrathoracic tuberculosis in children. International Union Against Turberculosis and Lung Disease (IUATLD). Paris, 2003
- Jose A. Caminero Luna. A Tuberculosis Guide for Specialist Physicians. International Union Against Turberculosis and Lung Disease (IUATLD). Paris, 2004
- Juan Carlos Palomino, Sylvia Cardoso Leão, Viviana Ritacco. Tuberculosis 2007. From basic science to patient care. www.TuberculosisTextbook.com

- Self-Study Modules on Tuberculosis. Centers for Disease Control and Prevention. Atlanta, Georgia, 2013
- Core Curriculum on Tuberculosis: What the Clinician Should Know. CDC. Fifth Edition 2011. www.cdc.gov/tb.
- Koshechkin V. A., Ivanova Z. A. Tuberculosis. Textbook. ГЭОТАР-Медиа, 2008

VI. Teaching and learning methods

Subject Pneumophthisiology is surrendered as a course in hospital, provides both lectures and practical lessons. The student is obliged to be present during the whole module, regardless of the hours of lectures or practical lessons. Lectures are read by the holders of the course. On practical lessons students study the subject Phthisiopneumology in Chisinau Municipal Hospital departments by clinical inspection of hospitalized patients, exposure, interactive debate, solving related tests, preparation of medical records and thematic clinical cases. The Department reserves the right to spend some practical work in interactive manner.

VII. Suggestions for individual activity

At present, the individual activity of medical student gradually becomes the main form of the educational process. As the result of individual activity accumulation, structuring and consolidation of knowledge take place.
From the pedagogical point of view, a less effective appropriate method is passive listening of the course, even if it is very carefuly structured and illustrated. It is necessary that theoretical knowledge has output in practice with applicative results. The practice fulfilling is much more effective, than just reading about how to do this. However, making a work without theoretical support tergiversate the expected result. There is one secret of success, namely the repetition and continuous improvement, but the most effective is to teach someone else to do some work. If you want to have success in assimilation of Pneumophthisiology course, work actively with the material. What does this mean:
1. Firstly read the material, but not simply, to complete it to the diagonally. Take notes. Try to formulate the main moments alone. Study the diagrams and images from the manual, resolve tests on this topic by youself.
2. Come to courses and practical lessons not only to be present, but with the thought of learning something new, to see live clinical cases, to review and reinforce the material studied at home with the help of the teacher. Otherwise

you will not meet the requirements. On the lectures you need to be actively involved in the topic, but not only automatically. Listen to the information and ask yourself: do you agree with the teacher? Do you understand what is it about? Does the material taught correspond to the manual?
3. Ask questions: ask the teacher, each other, youself. Once you ask the question, you are trying to understand and process the material taught, which can only be welcomed.
4. Organize in groups of 2-3 students to meet regularly in order to discuss the course material and prepare for practical lessons, exams. Usually, in small groups a much broader and clearer understanding is synthesizes, than working individually. In addition, the ability to explain the learned material to colleagues, is helpful.
5. Duration of Pneumophthisiology course is small, thing that provides for rational use of time and establishes a "gold" balance between the effort to obtain knowledge, other responsibilities and personal life.

VIII. Methods of assessment

Both formative assessment and final assessment are foreseen on the subject Pneumophthisiology.
Formative assessment is performed daily on practical lessons and includes several methods of assessment (oral answer, check written test, clinical cases, etc.). Formative assessment provides for students the obligatory presence at all lectures / practical lessons. In case of absence the student is required to recover these hours. Every practical lesson the student is rated at pretest estimating, works at the patient bed and practical theme appropriation. Daily Mark is the arithmetic mean of all samples presented during the lesson.
History report shall be noted on the base of its presentation and discussion at the end of the module (supporting).
Annual Attestation provides for deduction arithmetic average Mark of all daily marks plus the mark got during module on history report, which should not be less than grade 5.
Students with annual average under grade 5, and students who have not recovered absences from the practical work are not admitted to the colloquium.
Final evaluation in the form of colloquium is a combination of two steps - practical test and theoretical examinations (consisting of three questions). Colloquium is taken at the end of the module, in accordance with the rules of examination of students in force.
1. Theoretical part is oral and the mark consists 50% of the final grade. Theoretical test is performed by giving each student a question card, it contains three theoretical questions. Students have 30 minutes to prepare the answer. The exam is marked from 0 to 10. Theoretical examination is eliminatory, students

who do not obtain a minimum 5.00 grade can not be promote and do not pass practical exam. The obtained score is multiplied by 0.5 to give the final grade of the theory test.

2. The practical exam is oral, representing 20% of the final grade. It consists of: a. test of interpretation of radiological images, with different forms of pulmonary tuberculosis, b. description of clinical case - the teacher discusses with the student presented clinical case. Professor reserves the right to address the student questions from the rest of the theme.

In accordance with the regulation, the colloquium is promoted only if the mark for practical test is equal to or more than 5.00.

In case of failure of the theoretical exam, the student will recover the entire Colloquium. In case of failure only of practical test, the student will recover only the practical part of the Colloquium. Subjects of Colloquium (clinical cases and questions for the oral test), approved at the Department meeting, are announced to students at least one month before the Colloquium.

The final grade consists of three components: average mark (coefficient 0.3), practical skills test (coefficient 0.2) and oral test (coefficient 0.5). Knowledge (each component) is appreciated with grades from 10 to 1, with decimals and hundredths. The final grade is the average of current assessments and final examination, assessed with grades from 10 to 1 and decimal rounded to 0.5.

Method of mark rounding

The average of current and final marks	Final note
5	**5**
5,1 - 5,5	**5,5**
5,6 - 6,0	**6**
6,1 - 6,5	**6,5**
6,6 - 7,0	**7**
7,1 - 7,5	**7,5**
7,6 - 8,0	**8**
8,1 - 8,5	**8,5**
8,6 - 9,0	**9**
9,1 - 9,5	**9,5**
9,6 - 10	**10**

Absence on examination without good reason is recorded as "absent" and is equivalent to 0 (zero). The student has the right to re-tare the exam twice.

IX. Language of study: English