

**A.M. Budritsky, R.V. Romanovsky**

**STUDY GUIDE  
ON PHTISIOPULMONOLOGY**

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A.M. Budritsky, R.V. Romanovsky

**“MEDICAL CARD  
OF A PULMONARY TUBERCULOSIS  
IN-PATIENT”**  
*/study guide of phtisiopulmonology  
for 4<sup>th</sup> year medical students of medical universities/*

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Reviewers:

the Head of Infectious Diseases Department of Vitebsk State Medical University M.D. professor V.M.Semyonov

**A.M.Budritsky,**

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Study guide on Phtisiopulmonology is composed for individual work of the 4<sup>th</sup> year students of General Medicine Faculty and Overseas Students Training Faculty of medical universities in the preparation to supervising pulmonary patients and their medical case taking. The Study Guide corresponds to educational program on Phtisiopulmonology approved by Ministry of Health of the Republic of Belarus. The work contains defined purposes and tasks, methods of learning, material supplies. Main parts of training case history, advancement questions and literature are presented in details.

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A doctor of any speciality should be able to detect patients with active forms of pulmonary and extrapulmonary tuberculosis. In this connection the fourth year medical students should know compulsory, additional and facultative diagnostic minimum. be able to work with consumptives, to detect different risk factors. to manage the necessary examinations while assumption of tuberculosis in order to ascertain clinical form of tuberculosis and treat as clinically warranted.

Phthisiology is a separate medical and scientific speciality. Being infectious tuberculosis indicates the use of special antiepidemic measures, particular approaches in clinical examination and treatment. In this connection students must be able to make “Medical Card of In-patient” who is ill with pulmonary tuberculosis.

## **I. EDUCATIONAL AIMS**

Students should be able to:

1. collect and interpret information about the antecedent anamnesis;
2. examine a patient by means of physical methods, evaluate the results of laboratory and instrumental tests;
3. analyze and summarize different parts of a medical card for making a clinical diagnosis according to a clinical classification;
4. make a “Medical Card of In-patient” with clinical reasoning of pulmonary tuberculosis form, plan of curing and defining the prognosis of the disease.

## **II. MATERIAL SUPPLIES**

1. The tables: “Methods of tuberculosis detection and diagnosing”, “Factors of tuberculosis developing”, “Emergency tuberculosis contingent according to risk factors”, “Clinical classification of tuberculosis”.
2. A consumptive under supervision.
3. A “Medical Card of in-patient”
4. V.S. Samtsov, I.N.Gorbach “A Course of Lectures on Phthisiology”. Vitebsk, 2001, p. 141

### III. BASIC INSTRUCTIONAL LINES

Before the class students should study the methods of clinical examination of a consumptive (antecedent anamnesis, symptomatology, methods of physical, X-ray and laboratory examination). Monitoring of students' knowledge includes oral testing. A teacher recites the goal and tasks of students' individual work, supervises their work, and gives necessary consultations in the process of work. A student supervises a patient during course of studies. Cases of consumptives under supervision are discussed at practical classes. Then a student makes a "Medical Card of In-patient", a teacher checks it up to evaluate a student's practical skills.

### IV. THE CONTENT OF A STUDY

Each student supervises one consumptive and presents his case for clinical analysis at a practical class. For this patient "Medical Card" is made. Students may use the table "Methods of tuberculosis detection and diagnosing where diagnostic minimum is presented: CDM - main or compulsory, ADM - additional, ODM - optional (see the table 1).

Table 1

**Methods of tuberculosis detection and diagnosing  
(Diagnostic minimum -DM)**

CDM - main or compulsory (all patients)	ADM - additional (part of patients)	ODM - optional (is not necessary)
Information about character and duration of contact with a consumptive.	Tomography of lungs and other special methods of X-ray investigations.	Information about respiratory function (spirograph)
Antecedent anamnesis data.	Bronchoscopy and other doscopic methods of testing.	Electrocardiography.
Physical data (examination, palpation, percussion, auscultation).	Bacteriological sputum investigations.	Other biochemical parameters of blood (bilirubin, dolases, thymol test, urea etc.).
Information about previous X-ray examinations (data).	Subcutaneous introduction of tuberculin (Koch test).	information about functional condition of different organs.

sults)		
Information about the present X-ray examination with X-ray documents attached.	Biochemical blood analysis (albumin, globulin, protein fractions, haptoglobin, serumomucoid)	
General blood analysis.	Histological examination of bioptic material.	
Bacterioscopic examination of sputum for MTB.		
Tuberculin Mantoux test		

If a patient has caught tuberculosis for the first time it's more preferable to start learning the history of the disease and then the history of his life. While examining a patient with chronic tuberculosis it's better to start with asking about life anamnesis, as a patient's life is often nearly concerned in the history of the disease.

### A patient's Life History

A student should collect and analyze information about a patient's life in order to find out the causes of the disease and possible connection of the disease with adverse conditions of a patient's life.

While talking a student should ask about:

1. **Age.** There are four age groups: newborn children - up to four weeks; infants - the first year of life; pre-preschool children - 1-3 years old; preschool children - 3-7 years old; schoolchildren - 7-13 years old; high school children - 12,13 -16,17 years old (girls and boys); mature people - 20,21-55,60 years old (women and men); senior people - 55,60-75 years old; elderly people - over 75 years old; long-livers - over 90 years old.

Children of tender years come down with tuberculosis very rarely, mainly if they are in bacillar nidus. Children of preschool age and midchildhood are remarked by high resistibility tuberculosis infectious as a result of vaccination and re-vaccination. The development of local forms of tuberculosis is remarked very seldom in the pointed age groups. Teenagers and young people are infected and fall ill more often, specific gravity of local forms of pul-

monary and extrapulmonary forms of tuberculosis. Primary and secondary forms of tuberculosis are remarked at a young (18-30 years old) age.

Information about a place of residence is important for teenagers and young people so that there are more infected people in the countryside nowadays.

Secondary forms of tuberculosis are remarked in mature (30-40 years old) people. They have few concomitant illnesses but some harmful habits (especially men). Elderly (over 50) and old (over 70) people often have combination of tuberculosis and many other diseases.

**2. Education and occupation.** In case of tuberculosis a doctor is interested in a patient's education and occupation by two reasons. On the one hand these factors define social status of a patient. There are professions that are incompatible with tuberculosis because of its danger to other people. On the other hand there are professions that are harmful to a patient himself (a miner, a chemist, a combiner, a hot shop worker, etc.).

**3. Information about contacts with a consumptive.** The division should be started with the information about family status of a patient and his family members' health. Many consumptives have family relation disturbed, incomplete families. As a result they can feel insecurity, have no stimulus to get healthy, no motivation to long-lasting treating, maladjustment, alcohol dependence, asocial behaviour, indifference to his health state.

Depending on conditions of a person's life and work contacts can be permanent or occasional, familial, everyday, working as well. The term of contact and the age of a person are important. According to this information the term of contamination, solidity of primary infection, superinfection and sometimes the character of the infection nidus can be presupposed. It should be made a point of solidity of infection at tender age in the sense of immediate and long-term clinical outcome.

**4. Earlier diseases.** Many diseases together with social and epidemiological factors increase tuberculosis risk (see the table 3). Previous physical and psychic traumas, surgical interventions increase the disease risk.

Special attention should be paid to repeated flu, protracted pneumonia as tuberculosis can simulate these diseases.

If a patient once suffered from exudative pleurisy he should be interviewed about the age when it happened, duration of the disease, clinical outcome in details.

Earlier exudative preurisy, lymphadenitis, phlyctenular ceratoconjunctivitis, erithema nodosum, scrofula allow to find out the terms of tuberculosis infection or earlier primary tuberculosis.

All the data should be accurately analyzed.



Women should be asked about the beginning and peculiarities of menstrual cycle, the number of pregnancies, childbithes and abortions, gynecological diseases and their treatment including surgical.

**5. Tuberculin diagnostics.** Tuberculin Mantoux test is the method of early detection of tuberculosis in children and teenagers. Information about the results of that test detects the terms of infection. The information about the time if tubercular test conversion appearing is of prime importance. Those with hyperergic tuberculin tests are at risk.

**6. Adverse living conditions.** harmful habits, asocial behaviour increase the risk of tuberculosis, make it worse.

Students should collect and analyze anamnestic data purposefully in order to find out the disease cause and possible connection of tuberculosis and adverse living conditions of a patient (see the table 2,3). All the information should be reflected in the **summary** of a patient's life history.

**Summary:** to reveal the factors that aid development of introduction and catching tuberculosis in a supervised patient.

Table 2.

**Factors of tuberculosis developing**

Peculiarities of macroorganism	Peculiarities of microorganism	Peculiarities of surrounding
1. Age	1. Type of causative agent	1. Occupational hazards
2. Vaccination and vaccination BCG	2. Virulence of causative agent	2. Supercooling and overheating
3. Chemoprophylaxis	3. Solidity of infection	3. Radiation
4. Nutritional dystrophy	4. Superinfection	4. Chemical harmful substances
5. Avitaminosis	5. Resistance of causative agent	5. Traumas
6. Earlier diseases		6. Usage of immunosuppressive agents and hormones
7. Pregnancy, childbirth, lactation period		
8. Psychological and physical traumas		
9. Harmful habits		

## “THREATENED CONTINGENTS” HIGH-RISK GROUPS

“Threatened contingents” means the groups at tuberculosis risk 3 times and more as high as among the rest of the population because of high-risk factors.

Table 3.

**These contingents include the following groups:**

Social high-risk group	Medical high-risk group	Epidemiological high-risk group
<ul style="list-style-type: none"> <li>- persons of no fixed abode;</li> <li>- refugees, migrants;</li> <li>- persons who go at large;</li> <li>- persons who live in a slums and homes for superior and disable citizens;</li> <li>- persons who suffer from alcoholism and drug-addiction.</li> </ul>	<ul style="list-style-type: none"> <li>- HIV infected and immuno compromised patients;</li> <li>- patients who are ill with diabetes;</li> <li>- patients with occupational lung diseases;</li> <li>- patients with gastrointestinal tract diseases including those operated;</li> <li>- patients with obstructive lung diseases in case of at least recrudescence a year;</li> <li>- patients who are registered in narcological and psychiatric dispensaries;</li> <li>- persons who suffer from exudative pleurisy or recrudescence dry pleurisy;</li> <li>- patients with cachexia;</li> <li>- patients using corticosteroid, cytotoxic or radial therapy;</li> <li>- patients with signs of</li> </ul>	<ul style="list-style-type: none"> <li>- persons who are/were in close contact with consumptives;</li> <li>- teenagers or adults who live, work or study together with consumptives;</li> <li>- animals from tuberculosis risk areas;</li> <li>- persons who work in institutions of confinement and are in contact with prisoners;</li> <li>- persons who are discharged from institutions of confinement during first 2 years after discharge.</li> </ul>

	post-tuberculosis residual changes; - women in down-ly period; - persons who suffer from Chernobyl disaster.	
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**Above-mentioned persons should be X-rayed no less than once a year.**

### **Anamnes of present disease**

The following points of the present disease case should be studied:

- 1. The character of the first symptoms of the disease and their development.** While analyzing the symptoms one should remember that they can be representative of not only tuberculosis. Sometimes there can be no symptoms at all in spite of an active form of tuberculosis. It's important to fins out the term of the first symptoms appearing before tuberculosis detection.

Tuberculosis symptoms can be presented in the form of functional disorders typical for different infectious diseases (asthenia, anorexia, body weight loss, temperature rise, hyperhydrosis, etc.). There can be even signs of lesion in lungs, bronchus, pleura (cough, expectoration, bloody expectoration, pulmonary hemorrhage, dyspnea, chest pain and others). Many patients can recollect some symptoms only being questioned carefully. For the best idea of tuberculosis clinical aspects a student should ask about each symptom and its developing during the illness. Judging by the collected information a student should decide what diagnostic minimum to use.

- 2. Peculiarities of tuberculosis detection.** Tuberculosis can be detected in a patient's consulting a doctor because of poor health or in regular preclinical research. In case of late diagnostics of tuberculosis the reasons of it should be found out (late consulting of a patient, long-term care of another disease).
- 3. Information about applied methods of treatment.** Information received from a patient can be added with some from his medical documents. Tuberculosis etiology of lung disease can be revealed by analyzing of effi-

ciency of earlier therapy and comparing the received information with objective data.

Patients who treated tuberculosis earlier demonstrate evolution of the process, effectiveness of the treatment, terms of exacerbation and recidivation, drug resistance of MTB, acceptability of chemicals, applying of other methods of treatment (collapse therapy, surgical methods), and bacterioexcretion dynamics. The terms of prodromal chemical therapy course should be specified accurately.

- 4. Information about previous X-ray tests.** This information allows determining the time of tuberculosis development, if having X-ray documents observing the evolution of the process, activity of specific changes in lungs.

**Summary:** character of the disease manifestations or their absence, the peculiarities of tuberculosis detection, ineffectiveness of anti-inflammatory treatment, X-ray documents for preceding years can indirectly indicate specific character of pulmonary disease, its limited or extensive clinical form, the history of the disease in previously treated tuberculosis patients, attitude of a patient to the treatment, his drug tolerance, etc.

### **Physical examination data**

Examination, palpation, percussion, auscultation of a patient is carried out.

- 1. Examination of a patient.** General state of a patient, his constitution is estimated. But external examination doesn't always reveal the signs of tuberculosis. Only chronic long-lasting process with tuberculosis intoxication may change a patient's appearance. Paleness of skin, body weight loss, cyanosis of mucous tissue, acrocyanosis, changes of phalangettes' form, paraspecific implications of infection in essential forms of tuberculosis (nodal fever, tuberculides, phlyctenular ceratoconjunctivitis, changes of lymph nodes), widening of subcutaneous veins on the front the anterior wall of the chest and the belly.

Asymmetry of the chest and excursion of breath may be very important in the process of diagnosing of case. Retraction of sub- and supraclavicular spaces demonstrates shrinkage of apex pulmonis. Decrease of the volume of one art of the chest is the result of huge cirrhotic changes in lungs, the result of pulmonary fibrosis. An important sign of active tuberculosis process is respiration lagging in infected part.

The number of postinoculative paunches on the left shoulder should be paid attention to.

2. **Palpation.** While palpation the following things can be observed: enlarged lymph nodes, painfulness and tension of thoracic cage and girdle muscles (symptom of Pottenger-Vorobyov) which is functional defense as a result of the reflex from the inflamed pleura onto the corresponding muscle groups. Considerable atrophy of thoracic girdle muscles can be observed in case of progressing process. Evident painfulness of intercostals nerves can be found out in case pleurisy. painfulness of chest – in case of mediastinitis. While palpating vocal tremor with pointed localization or lack of it can be cleared up.
3. **Percussion.** In comparative percussion the areas of changed percussion sound are found out that can be caused by changes as in lungs as in pleura. With the help of topographical percussion inferior lungs borders, the height of lung apex to collar bones and spinous process of vertebra prominens, width of Krening areas and mobility of lower lung borders are identified.
4. **Auscultation.** While examining a consumptive correct auscultation of lungs is of great importance. At first a patient should be auscultated while breathing in a usual way, then while breathing deeply with a half-open mouth. At this moment a patient is asked for soundless coughing and taking a deep breath. This method allows detecting catarrhal phenomena which are not identified while breathing as usual. “Alarm zones” should be auscultated thoroughly: supraclavicular fossas, interscapular and suprascapular regions, the lower corner of scapula. While auscultating the character of breathing and catarrhal phenomena is identified. There can be vesicular (diminished or exaggerated), harsh, bronchial, amphoric respiration. Vesicular respiration is auscultated above unchanged parts of lungs. It can be weak for example as the result of responsive narrowing of the affected areas while breathing or as the result of contraction of lungs by exudates or air because of the massive pleural thickenings. Vesicular respiration can become rough because of the changed in the mucous membrane of bronchus.

Bronchial breathing is usually auscultated in front of trachea, behind the cervical vertebra and in the interscapular area above the bifurcation of trachea. Above the lungs bronchial breathing is auscultated in case of massive infiltration and induration of lungs which create conditions for conducting the sound from large bronchi. With less induration of lungs rough breathing is auscultated. Amphoric breath sounds are heard in case of large cavities (not less than 6 cm in diameter) with a good drainage

function of the revent bronchi. Bronchovesicular, vesicobronchial and saccadic breathing can be identified.

The detection of heterogeneous dry and moist rattlings of different sonority is of great diagnostic value. In case of an active form of tuberculosis and incipient pulmonary disintegration small bubbling moist rattlings can be sometimes auscultated on a limited area and only while coughing.

**Summary:** objective information showing the localization, prevalence and character of the pathologic process in lungs should be revealed.

5. **Information about other body organs examination.** Other body organs should be examined according to Study Guide on propedeutics of internal diseases for medical students "A Therapeutic Patient Examination Technique" (Vitebsk, EE "VSMU", 2007).

**Summary:** information about other body organs involved into the pathologic process should be noted; concomitant pathology may either be the risk factor of developing tuberculosis or may complicate the process of treating.

### **Data of laboratory, X-ray and other tests**

1. **Mycobacterial test.** Bacteriological and bacterioscopic methods are used to reveal mycobacterium in pathologic material. An object of the research is often sputum and epithelial lining fluid of tuberculosis lungs. Stomach scourage researching is used in children. Punctates from close cavities, suppuration, biopsy material, urine are studied on account of mycobacterium either. When revealed the ruggedness of bacterioexcretion is taken into account. MB tests are done during the process of treatment and show the effectiveness of chemical therapy.
2. **Peripheral blood test.** Students study peripheral blood indices got on the day of admission of a patient to hospital and on the day of his supervision. Pathologic changes are estimated.

In case of tuberculosis ESR (erythrocyte sedimentation rate) index and the number of leukocytes (up to  $10-12 \cdot 10^9/l$ ) are usually increased. Left leukogram shift, lymphopenia and monocytosis are also observed. Lymphosytosis can be revealed in case of limited form of tuberculosis.

3. **Urine test.** Protein, hyaline and granular cylinder can be observed in urine of a consumptive as the result of intoxication.
4. **Biochemical blood analysis.** Changes of albumin and globulin ratio can be revealed while examining protein profile of a consumptive. Increasing of the number of globulins because of  $\alpha_2$  and  $\gamma$ -fractions and decreasing of albumin-globulin coefficient are observed in case of far gone forms

of tuberculosis. Glucose, urea, alanine and asparaginic transaminases indices are important.

**Summary:** to note pathologic changes of laboratory that this may reveal evident intoxication. In case if mycobacterium found in sputum or scourage of bronchial tubes a student should note that it is a reliable symptom of an active form of tuberculosis.

5. **Instrumental methods of research.** Bronchoscopy and some microsurgical interventions of bioptic character are also used in diagnostics and differential diagnostics of tuberculosis and other forms of pulmonary diseases.
6. **X-ray test.** X-ray tests are the main part of clinical examination of a consumptive. The main methods are radiography and fluorography. General, lateral oblique and enlargement X-ray films can be used. Additional or special methods of X-ray examination are rather numerous. Body-section radiography (tomography), computer tomography and magnetic resonance tomography are often used.

Students describe X-ray pictures, tomograms and other radio-documentation individually. They make an act of X-ray examination and formulate a provisional roentgenologic diagnosis.

7. **Tuberculin diagnostics.** Tuberculin tests are used to diagnose and differentiate tuberculosis. The tests help to select those who need BCG revaccination. Tuberculin Montoux tests with 2 TE PPD-L are used prevalently. The results of tests are estimated by students on their own.

### **Substantiation of diagnosis**

Substantiation of diagnosis is based on subjective, objective, laboratory and instrumental data got in the process of a patient's examination. This part consists of well-considered and logical summaries on each part of a medical history. The diagnosis is formulated according to the requirements of "Clinical classification of tuberculosis" and is written on the front page of a "Medical card of a hospital patient".

### **Plan of treatment**

Based on proven clinical diagnosis of tuberculosis, the term of definition and duration of the disease, previous treatment and dynamics of the process medical category a patient belongs to should be pointed first of all (according to "Clinical guidance on tuberculosis treatment", Minsk, 2009). Information about drug endurance, drug sustainability to MB and concomitant diseases

should be taken into account while prescribing chemotherapy. Continuous poly-chemotherapy of tuberculosis for both in- and out-patients, seasonal courses of chemotherapy should be planned. If it is necessary surgical methods of treatment should be provided.

### **A journal**

A student keeps a journal in a "Medical card of an in-patient". Medical prescriptions, their dosage and introduction methods, hygienic and dietary regimen are recorded there.

### **Prognosis**

Prognosis for health and job placement should be based on the results of examinations and planned treatment.

### **Work in effective tuberculosis area**

An effective tuberculosis area is a place where a person discharging bacteria lives. Depending on the ruggedness of bacterioexcretion, the presence of children and teenagers, living conditions, observance of sanitary and hygienic regulations an effective tuberculosis area is divided into four groups. The work is underway in the following directions: work with an ill person, work with those who were in contact, disinfection, solving of social and living problems. Students should describe the measures taken in an effective tuberculosis area in details.

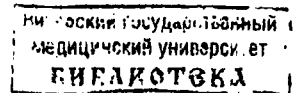


## **V. ADVANCEMENT QUESTIONS**

- 1. Sources of tuberculosis infection, characteristics of the factors contributing to the infection.**
- 2. People with high risk of tuberculosis developing.**
- 3. Peculiarities of life anamnesis of a consumptive, characteristic of the factors contributing to development of tuberculosis.**
- 4. Peculiarities of antecedent anamnesis of a consumptive.**
- 5. Accurate signs of tuberculosis.**
- 6. Peculiarities of physical examination of a consumptive.**
- 7. Obligatory diagnostic minimum of examining a patient by a general practitioner if there is a suspicion of tuberculosis.**
- 8. Principles of making a diagnosis according to modern classification.**
- 9. Multimodality therapy of consumptives.**
- 10. Medical categories. Peculiarities of treatment of new-onset, previously treated patients and patients with chronic forms of tuberculosis.**
- 11. Ways of introduction of antituberculous drugs, indications.**
- 12. Classification of effective tuberculosis areas. Antiepidemic measures.**

## VI. LITERATURE

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**Будрицкий Александр Михайлович,  
Романовский Реанольд Васильевич**

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Редактор Н.Ю. Коневалова  
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Компьютерная верстка М.А. Корнилова  
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