

Topics on pulmonary medicine for the students of medicine to prepare for the 4th-to-6th-year examinations (from the year 2017) with recommended study literature

1. Major symptoms and signs of respiratory diseases (cough, sputum production, hemoptysis, dyspnea, wheeze, stridor, chest pain, snoring, daytime sleepiness etc.): variations and combinations with respective clinical interpretation.
2. Physical examination of the pulmonary patient. Variants of the findings on inspection, palpation, percussion, and auscultation of the chest and links to different respective respiratory diseases and clinical conditions. The significance of extrapulmonary signs and symptoms.
3. Principles and methods of lung function testing. Spirometry. Major patterns of the ventilation failure: airflow obstruction and restrictive pattern. Bronchodilator reversibility test, understanding and application of the results of this test. Measurement of the peak expiratory flow (PEF). Standardized exercise tests. Bronchial challenge tests, measurement of the diffusing capacity of the lung, principles of body plethysmography. Blood gas analyses and pulse oximetry, understanding the clinical significance of the results.
4. Pulmonary radiological diagnostics: roentgenoscopy of the chest; chest X-ray, most widely used projections. Computed tomography (CT) of the chest, high-resolution CT (HRCT), CT with use of contrast media, CT-angiography; magnetic resonance imaging (MRI), positron emission tomography (PET), and single photon emission computed tomography (SPECT): indications and the diagnostic value in pulmonary medicine.
5. Endoscopic and other invasive methods of diagnostics in pulmonary medicine: bronchoscopy with ancillary methods of investigation, classification of bronchoscopy by its purpose. Transpleural ultrasound, transthoracic core needle biopsy, thoracentesis, and pleural biopsy.
6. Biochemical and immunological mechanisms of defense in the lower respiratory tract (in the conducting airways and at the alveolar level), the innate and acquired immunity.
7. Bronchial asthma: definition and nature of the disease, pathogenesis of asthma.
8. Asthma: basics on epidemiology. Risk factors and clinical signs and symptoms of asthma. Diagnostic criteria and practical diagnosis of asthma in different clinical settings and in patients with various degrees of severity of asthma.
9. Classification of asthma: degrees of severity and clinically significant phenotypes of asthma. Differential diagnosis of asthma; differentiation of asthma from chronic obstructive pulmonary disease (COPD) and asthma and COPD overlap syndrome (ACOS).

10. Goals of treatment in asthma. Principles of treatment of stable asthma. Asthma medicines that are in use: applied classification. Practical treatment of asthma at different degrees of severity, as well as according to the clinical phenotypes. Guidance of the management of asthma.
11. Exacerbations of asthma: typical reasons and triggers. Signs and symptoms of exacerbations of asthma. The diagnosis, assessment of severity, and management in outpatient and emergency room/hospital settings. Indications for hospitalization in exacerbations of asthma.
12. Chronic obstructive pulmonary disease (COPD): the nature of the disease, its epidemiology with current trends. Etiology, risk factors, and pathogenetic mechanisms of COPD. The two main substrates of COPD: emphysema and „small airway disease“ (in „airway-type COPD“), their nature and mechanisms of fixed airway obstruction and gas exchange disturbances in these conditions.
13. Clinical COPD: symptoms, signs, appearance, and course of the disease. Difference between „airway-type COPD“ and emphysema-based COPD. The diagnosis and differential diagnosis of COPD.
14. The goals and principles of the present-day treatment of COPD. The medicines used for treatment of COPD. Rehabilitation in chronic respiratory diseases (the essence of pulmonary rehabilitation (PR), components, methods, and goals of PR; assessment of the patient in association with PR)). The significance of smoking cessation in medicine; possibilities and means of smoking cessation.
15. Exacerbations of COPD: more frequent reasons, symptoms and signs; assessment of severity, criteria for hospitalization, and management, both in outpatient and hospital settings.
16. Acute tracheitis and bronchitis: etiology, clinical presentation, differential diagnosis, and treatment. Significance of acute bronchitis in the context of other lower respiratory tract infections (LRTI).
17. Chronic bronchitis: definition, etiology, clinical presentation, diagnosis, differential diagnosis, and treatment. Acute exacerbations of chronic bronchitis (AECB): symptoms and signs; antibacterial treatment and its indications in AECB.
18. Pneumonias: definition and principles of classification. Etiology in general; etiology in the context of clinical-demographic properties of the patient, as well as with the type of pneumonia. Pathogenesis of pneumonia.
19. Typical pneumonia: clinical signs and symptoms, diagnosis, diagnostic criteria, and course of the disease. More frequent and more severe complications of pneumonia, methods of their prevention.

20. Differential diagnosis of pneumonias.
21. Principles of the management of pneumonia. Categories of patients according to the risks and treatments applied. Treatment of pneumonia in different clinical circumstances (in- and outpatient settings). Principles for making decisions for hospitalization in patients with pneumonia.
22. Assessment of adequacy of the response to treatment in pneumonia; non-responding and slowly responding pneumonia; management of the non-responding pneumonia.
23. Atypical pneumonias: the nature, etiology, and peculiarities in terms of clinical presentation, course, and management.
24. Health care-associated pneumonia: its nature and sub-classification. Nosocomial pneumonia: its essence and major differences from community-acquired pneumonia with regard to etiology, classification, clinical course, and treatment.
25. Pleural empyema, lung abscess, and pyopneumothorax as major complications of pneumonia: mechanisms, etiology, diagnosis, course, and principles of management.
26. Bronchiectasis (BE): its nature, classification, etiology, clinical presentation, contemporary diagnostics, and treatment. Goals and possibilities of non-surgical management of BE. Indications and principles of surgical treatment of BE.
27. Respiratory manifestations of cystic fibrosis (CF): diagnosis and course of the disease. Contemporary principles of management.
28. Pleural effusions: the major mechanisms of accumulation of the fluid in the pleural cavities, involvement of particular mechanisms in various diseases that may affect the pleura or that can be characterized by accumulation of the fluid. Clinical signs and symptoms that derive from the presence of pleural effusions. Diagnostic goals, methods, and strategies in patients with pleural effusions. Pleurisy. Classification of the pleural effusions, criteria for distinguishing between transsudates and exsudates, clinical significance of pleural effusions with various parameters. Indications and methods for pleurodesis.
29. Pleural mesothelioma: clinical presentation, diagnosis, and principles of management.
30. Neoplasms of the airways and lung: benign and malign tumors. Lung cancer: epidemiology, etiology, and histopathological classification; incidence and prevalence of the different histopathological types of lung cancer.
31. Lung cancer: clinical signs and symptoms (rising from the growth of the primary tumor, from the spread of the tumor, and from secondary changes occurring in the tumor); major paraneoplastic syndromes.

32. Lung cancer: various aspects of the diagnosis and practical diagnostic workup: necessary investigations. Principles of the TNM classification and staging of lung cancer.
33. Lung cancer: principles and possibilities of treatment according to the histopathological types and stages. Non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC): differences with regard to biological properties, assessment of spread, and treatment. Prognosis of lung cancer by the histopathological types and stages.
34. Pulmonary embolism. Classification. Pulmonary thromboembolism (PE): risk factors and pathophysiology. Deep venous thrombosis (DVT) and PE. Clinical presentation, diagnostic methods, and ancillary investigations in PE. Diagnostic algorithm of PE. Assessment of probability of PE and confirmation of the diagnosis.
35. Classification of PE according to its clinical severity and risks to the patient, risk assessment-based approach to the patient management. Methods of treatment of PE, practical management and prognosis of PE.
36. Pulmonary hypertension (PH): the nature of this group of conditions, classification, core clinical presentations. Causes of PH by the valid classification. Pulmonary arterial hypertension (PAH): sub-classification according to the etiology. The diagnostic work-up (diagnostic algorithm), methods of assessment of the patient and response to treatment, principles of contemporary management, and prognosis of PAH. Chronic thromboembolic pulmonary hypertension (CTEPH).
37. Interstitial lung diseases (resp. diffuse parenchymal lung diseases): the essence and classification; groups of the diseases that are included in this major group.
38. Idiopathic interstitial pneumonias (IIP): members of this group. Idiopathic pulmonary fibrosis (IPF): the essence, clinical presentation, diagnosis, differential diagnosis, and current treatment. Acute exacerbation of IPF.
39. Hypersensitivity pneumonitis (HP): the nature of this assembly of pulmonary conditions, etiology, and major pathogenetic mechanisms. Types of HP (acute and chronic forms), their clinical presentations, diagnosis, management, and prognosis.
40. Sarcoidosis: nature of this disease, epidemiology, and general pathogenesis. Variants of the clinical course of sarcoidosis: acute and chronic. Pulmonary manifestations of sarcoidosis with radiological stages. Main extrapulmonary manifestations of sarcoidosis. Diagnosis of sarcoidosis, necessary investigations, differential diagnosis, indications for treatment, and pharmacotherapy of sarcoidosis. Prognosis according to the type of the course of the disease, organ involvement, and radiological stage of the pulmonary lesions.
41. Major forms of the respiratory manifestations of systemic connective tissue diseases (rheumatoid arthritis, systemic lupus erythematosus, systemic sclerosis, dermatopolymyositis, mixed connective tissue disease etc.).

42. Vasculitis involving the lungs. Pulmonary manifestations of the major forms of vasculitis: granulomatosis with polyangiitis (formerly Wegener's granulomatosis), eosinophilic granulomatosis with polyangiitis (formerly Churg-Strauss syndrome), microscopic polyangiitis), diagnosis and treatment.
43. Sleep-disordered breathing: classification, clinical manifestations, main diagnostic methods, and distinguishing between different forms. Obstructive sleep apnea-hypopnea syndrome (OSA(H)S): main mechanisms, clinical signs and presentation, diagnosis, and current means of management.
44. Tuberculosis: epidemiology, reasons for deterioration of the epidemiological situation.
45. Getting infected with tuberculosis, major mechanisms of transmission of tuberculosis; pathogenesis of tuberculosis. Various clinical forms of pulmonary tuberculosis with the respective clinical presentations. More frequent forms (localizations) of extrapulmonary tuberculosis with the respective signs, symptoms, and diagnosis.
46. Current principles of the diagnosis of tuberculosis. Immunodiagnosis of tuberculosis (tuberculin skin test, interferon-gamma releasing assay (IGRA)). Main tests performed in the laboratory of mycobacteriology. The issues of drug-resistance in tuberculosis: reasons for development and means for prevention. Multidrug-resistance and polyresistance.
47. Pharmacotherapy of tuberculosis. Applied classification of anti-tuberculosis drugs, principles of composing drug regimens to treat drug-sensitive and drug-resistant tuberculosis. Main side effects of the anti-tuberculosis drugs. Treatment of extra-pulmonary tuberculosis. Organizational aspects of the anti-tuberculosis treatment. Principles of the directly observed treatment (DOTS).
48. Current principles and methods of tuberculosis control. Vaccinations against tuberculosis and non-specific prophylaxis. Causative agents and current principles of the diagnosis and management of the more frequent non-tuberculous mycobacterioses.

Study literature

1. Principles of Pulmonary Medicine, 6th Edition. Steven E. Weinberger, Barbara A. Cockrill, and Jess Mandel, Elsevier Saunders, Philadelphia, 2014; 416 pp. (ISBN: 978-1-4557-2532-8).
2. Clinical Respiratory Medicine, 4th Edition. Stephen G. Spiro, Gerard A. Silvestri, and Alvar Agustí, Elsevier Saunders, 2012; 1000 pp. (ISBN: 9781455707928).
3. Harrison's Pulmonary and Critical Care Medicine. Joseph Loscalzo (Ed.), McGraw Hill Medical, New York *et al.* 2010; 580 pp. (ISBN: 978-0-07-166338-0).
http://umsha.ac.ir/uploads/Harrisons_Pulmonary_and_Critical.pdf
4. Chest Medicine: Essentials of Pulmonary and Critical Care Medicine. Ronald B. George, Richard W. Light, Michael A. Matthay, Richard A. Matthay (Eds.), Lippincott Williams & Wilkins, Philadelphia *et al.* 2005; 652 pp. (ISBN: 978-0-7817-5273-2).

5. Current Diagnosis & Treatment in Pulmonary Medicine. Michael E. Hanley, Carolyn H. Welsh (Eds.). Lange Medical Books/McGraw-Hill, New York *et al.*, 2003; 481 pp. (ISBN: 0-07-121971-4).
6. Pulmonoloogia ja torakaalkirurgia eriala õppematerjalid
<http://www.kliinikum.ee/kopsukliinik>

Textbooks

1. Murray and Nadel's Textbook of Respiratory Medicine, Sixth Edition. V. Courtney Broaddus *et al.* (Eds.), Elsevier Saunders, 2016; 2064 pp. (ISBN: 978-1455733835).
2. Fishman's Pulmonary Diseases and Disorders, Fifth Edition, Michael A. Grippi *et al.* (Eds.), McGraw-Hill Education, 2015; 2400 pp. (ISBN 978-0-07-180728-9; MHID 0-07-180728-4).