INTERNATIONAL HIGHER SCHOOL OF MEDICINE

Internal Medicine Department

SYLLABUS

Discipline: Pathologies caused by high altitudes

2025-2026 academic year

for students of medical faculty

5 course 10 semester,

1 credits (30 h, including auditorial 18 h, independent work – 12 h)

Lecturer: **Moldoeva Salamat**

Practical classes: 996772193729 phone (Whatsapp)

Email: s.moldoeva@gmail.com

Venue: Zoom

The Syllabus is considered

at the meeting of the department of internal medicine

Protocol № 1 dated 03.09.2025

Head of the department prof. Kudaibergenova N.T.

Course Objective: Teaching a student to identify risk factors for specific pathologies caused by high altitudes, the peculiarities of the course and treatment of diseases of internal organs in high altitude conditions in accordance with the principles of evidence-based medicine and modern advances in therapeutic and diagnostic technologies.

Knowledge:

- Influence of alpine hypoxia on the organism of the population living in mountainous areas.
- etiology, pathogenesis, clinical picture, diagnosis, course features, assistance in acute mountain sickness.
- Risk factors, pathophysiology, clinical presentation, diagnosis and treatment of primary pulmonary hypertension.
- Interpret the results of laboratory and special research methods for diseases of internal organs in high altitude conditions.
- to determine a plan of treatment measures for various forms of mountain sickness in accordance with the standard of medical care.
- Treatment of the most common diseases of the internal organs in high altitude conditions.

Skill:

- to establish the possible causes and nature of altitude sickness, taking into account the influence on the body of climatic social, hereditary, age factors.
- to assess the severity of disturbances in the impact of high-altitude hypoxia on the body of a healthy person and a patient in connection with the risk of developing diseases of internal organs.
- make the right decision on the tactics of managing a patient with acute mountain sickness.
- to choose the tactics of patient management, taking into account the individual and pathogenetic characteristics of the course of pathologies of internal organs in high altitude conditions.
- to develop a plan for the rehabilitation and prevention of pathologies of internal organs in high mountains.

Attitude:

- fundamentals of medical deontology and medical ethics;
- evaluation of the results of laboratory and special research methods (clinical, functional, morphological, biochemical, immunological, serological parameters of blood, urine, sputum, feces, cerebrospinal fluid, coagulogram indicators);
- interpretation of the results of functional examination of the respiratory system, cardiovascular system, gastrointestinal tract, liver, kidneys, central nervous system, blood system etc.;
- the method of management of internal diseases, pathological conditions, in accordance with the standard of medical care for diseases of internal organs;
- registration of medical documentation in the hospital and on an outpatient basis.

Pre-requisites.

- Anatomy (macro-microanatomy) Normal physiology
- Pathological anatomy Pathological physiology Pharmacology
- Propedtherapy

Post-requisites:

- General Surgery
- Oncology
- Occupational Diseases
- Public Health
- Dermatovenereology
- Infectious Diseases
- Outpatient Therapy
- Medical Supervision
- Family Medicine
- Obstetrics and Gynecology
- Anesthesiology, Intensive Care, and Emergency Care

Thematic plan of lectures

№	Theme of lecture	Hours	Date
1	Mountain sickness	2	09.2025-05.2026
2	Primary pulmonary hypertension	2	09.2025-05.2026
3	Features of the course of diseases of the cardiovascular, bronchopulmonary, endocrine, digestive, urinary, musculoskeletal systems in high mountains.	2	09.2025-05.2026

Thematic plan of practical lessons

№	Theme of practical class	Hours	Date
1	Acute and chronic mountain sickness	2	09.2025-05.2026
2	Primary pulmonary hypertension	2	09.2025-05.2026

3	Characteristics of the disease course and therapeutic possibilities for treating cardiovascular diseases at high altitudes. Characteristics of the disease course and therapeutic possibilities for treating cardiovascular diseases at high altitudes.	2	09.2025-05.2026
4	Disease progression characteristics and therapeutic options for treating bronchopulmonary diseases at high altitudes.	2	09.2025-05.2026
5	Disease progression characteristics and therapeutic options for treating endocrine, digestive, urinary, and musculoskeletal diseases at high altitudes.	2	09.2025-05.2026
6	Unit control	2	09.2025-05.2026

THEMATIC PLAN OF INDEPENDENT WORK OF STUDENTS

№	Theme of independent work	Hours	Date
	Answering test questions, completing homework tests (solving problems), writing an essay; completing homework for class, reading text (textbook, additional literature)	12	09.2025-05.2026

Recommended reading for the discipline:

1. Basic:

№	Authors	Title	The year of publishing	Availability in the IHSM library (number of)
1	Erik R. Swenson, Peter Bärtsch	High Altitude: Human Adaptation to Hypoxia.	2014	1

2. **Additional:**

№	Authors	Title	The year of publishing	Availability in the IHSM library (number of)
1	James S Milledge, John B West, Robert B Schoene.	High Altitude Medicine and Physiology	2004	1

Grading policy and procedures for all types of work

For the period of studying the discipline, the student gains points for the relevant parameters (per unit):
current score - 40 points
independent work - 20 points
control score (final assessment of knowledge per unit) - 40 points
Maximum score - 100 (40+20+40)

Grading system for student's achievements

Criteria for assigning grades for the course				
Maximum score	Intervals			
	« unsatisfactory»	« satisfactory»	«good »	«excellent»
40	0-23	24-30	31-35	36-40
Interval criteria	Frequently misses classes, does not	Sometimes he misses classes, completes	Rarely misses classes, is active, completes	Attends all classes,

	complete homework or prepare for class, and is inactive in class. Unable to apply acquired knowledge to solving clinical problems.	assignments, but with serious errors, is active in class, but does not differentiate the diagnosis of various diseases.	homework, and is almost always prepared for class. Able to solve clinical problems, but with minor errors.	completes homework, and correctly analyzes clinical problems involving various diseases
IWS-20	0-11	12-14	15-17	18-20
Interval criteria	assignments for independent work are not completed, or they contain numerous errors; the student has not met the requirements for composing the work	The tasks for independent work are completed, but with errors; 2 points are missing from the program.	assignments for independent work are completed, mostly without errors or with minor errors, one point is missing from the program	assignments for independent work are completed without errors, the material is fully prepared according to the sample
40	0-23	24-30	31-35	36-40
Interval criteria	The answer represents disjointed knowledge with significant errors regarding the question; - fragmentary and illogical presentation; the student does not understand the connection between the question being discussed and other subjects of the course; speech is illiterate; - significant errors in demonstrating exercises; incorrect choice of tactics for	The answer is incomplete, contains errors in detail, the ability to convey the meaning of generalized knowledge is not demonstrated, and the student's speech requires correction and adjustments; - the logic and consistency of presentation are impaired; the student is unable to independently identify essential and non-essential features and cause-and-effect relationships; - errors in the prescription and correct choice of treatment method;	A complete, detailed answer to the question was given, demonstrating the ability to distinguish essential and non-essential features and cause-and-effect relationships; - the narrative is not logical enough, with isolated errors in details, which the student corrected with the teacher's assistance; - insufficient confidence and speed in demonstrating the exercises; - isolated errors in technique; - answers to additional	A complete, detailed answer to the question posed is provided; - the answer has a clear structure and logical sequence, reflecting the essence of the concepts, theories, and phenomena being explored; - the exercises are selected and performed correctly; - answers to

	the given disease; - incorrect answers to additional questions.	- numerous errors in patient management tactics; - the student is unable to answer most of the additional questions.	questions are correct, but not sufficiently complete and clear.	additional questions are clear and concise;

Conduct Policy: (lateness, absence, behavior in the auditorium, late submission of work).

- Punctuality and completion of tasks.
- Mandatory attendance of classes.
- Attending class in a clean medical uniform.
- Eliminating conversations on a cell phone in the classroom.
- Active participation in the learning process.
- Doing homework on time.
- Academic detention at the time specified by the teacher.

For violations of the Conduct Policy, the total points for discipline might be reduced to 1-10 points.

Academic Ethics Policy.

- Be tolerant, respect the opinions of others.
- Formulate objections in the correct form.
- Constructively support feedback in all classes.
- Plagiarism and other forms of dishonest work are unacceptable. Plagiarism includes the following: the absence of references when using printed and electronic materials, quotes, thoughts and works of other authors or students.
- Prompting and cheating during tests, exams, classes is unacceptable as well as passing an exam for another student, unauthorized copying of materials.

For violations of the Academic Ethics Policy, the total points for the discipline may be reduced to 1-10 points.

Guidelines for the lessons of the discipline

Key questions covered in lesson 1. Teaching a student should get information about Epidemiology. Risk factors. Pathogenesis mountain sickness. The clinical picture, taking into account the stage and variant of the course of the disease. Classification. Laboratory and instrumental research. Diagnosis criteria. Treatment. Forecast

Recommended reading for the lesson:

Swenson E.R., Bärtsch P. (eds.) *High Altitude: Human Adaptation to Hypoxia*. Springer, 2014: p 301-330: p 381-410

Key questions covered in lesson 2.. Teaching a student should get information about Primary pulmonary hypertension. Risk factors. Etiology. Pathogenesis. Classification. Clinic. Treatment principles. Forecast. Prevention.

Recommended reading for the lesson:

Swenson E.R., Bärtsch P. (eds.) *High Altitude: Human Adaptation to Hypoxia*. Springer, 2014: p 101-150; p 351-380

Key questions covered in lesson 3. Teaching a student should get information about features of the course of diseases of the cardiovascular (GB, CHD, CHD, acquired heart defects, HF),

Recommended reading for the lesson:

Swenson E.R., Bärtsch P. (eds.) *High Altitude: Human Adaptation to Hypoxia*. Springer, 2014: p 101-140; p 431-470

Key questions covered in lesson 4. Teaching a student should get information about features of the course of diseases of the bronchopulmonary (COPD, BA), endocrine (diabetes, thyroid disease), digestive (chronic gastritis, gastric ulcer and 12 duodenal ulcer, Crohn's disease , NUC, hepatitis, chronic pancreatitis), urinary (acute and chronic glomerulonephritis, chronic pyelonephritis, CKD), musculoskeletal systems (RA, SLE) in high mountains. Treatment principles. Forecast. Prevention.

Recommended reading for the lesson:

Swenson E.R., Bärtsch P. (eds.) *High Altitude: Human Adaptation to Hypoxia*. Springer, 2014: p 61-100; p 471-500

Key questions covered in lesson 5. Teaching a student should get information about features of the course of diseases of the endocrine (diabetes, thyroid disease), digestive (chronic gastritis, gastric ulcer and 12 duodenal ulcer, Crohn's disease , NUC, hepatitis, chronic pancreatitis), urinary (acute and chronic glomerulonephritis, chronic pyelonephritis, CKD), musculoskeletal systems (RA, SLE) in high mountains. Treatment principles. Forecast. Prevention.

Recommended reading for the lesson:

Swenson E.R., Bärtsch P. (eds.) *High Altitude: Human Adaptation to Hypoxia*. Springer, 2014: p 181-240; p 431-

470; p141-180; p241-300

Methodological instructions for the implementation of independent work on the discipline

Topics for students' individual work (SIW). Questions for individual and frontal survey

1. Pathogenesis of the development of mountain sickness.
2. The effect of cold on the human body.
3. Processes of adaptation, compensatory reactions of the CVS, at the tissue level.
4. Periodic breathing.
5. Electrolyte disturbances: hypokalemia; immune disorders.
6. Changes in the internal organs: the digestive system, vision, dehydration, mental disorders.
7. Altitude hypoxia.
8. Classification of heights and characteristic physiological changes.
9. Factors influencing the development of altitude sickness.
10. Individual factors: individual resistance of people to a lack of oxygen (for example, among the inhabitants of the mountains), gender, age, physical, mental and moral condition; level of fitness; speed of climb; the degree and duration of oxygen starvation; the intensity of muscle efforts; past "high-rise" experience.
11. Provoking factors: alcohol, caffeine, insomnia, overwork; psychoemotional stress, hypothermia, poor-quality and inappropriate nutrition, violation of the water-salt regime, dehydration, overweight, respiratory and other chronic diseases (for example, tonsillitis, bronchitis, pneumonia, chronic purulent dental diseases), blood loss.

PPT: Each student must prepare a 10-15 slide PowerPoint presentation on their assigned topic.
The presentation must include a theoretical overview, practical applications, and current research findings

Summary: The essay should be **3–5 pages** (Times New Roman, font size 12, line spacing 1.5).

1. **Structure**
   - **Introduction**
     - Justification of the topic choice.
     - Aims and objectives of the essay.
   - **Theoretical Overview**
     - Key concepts and definitions.
     - Main theories, approaches, or models related to the topic.
   - **Practical Applications**
     - Examples of applying theory in real practice.
     - Case studies, clinical cases, or applied research.
   - **Current Research Findings**
     - Brief review of recent publications (last 5–7 years).
     - Key conclusions of modern researchers.
   - **Conclusion**
     - Summary of the analysis.
     - Personal perspective or recommendations.
2. **Formatting**
   - References must be included.
   - Bibliography at the end (at least 5–7 sources, preferably scientific articles and textbooks).
   - Clarity and logical flow of the text.
3. **Content Requirements**
   - Clear connection between theory and practice.
   - Critical analysis rather than simple retelling.
   - Ability to highlight the main points.