

**Sumy State University**  
**Medical Institute**  
**Internal medicine department with respiratory medicine center**

***Methodological Instructions for 5<sup>th</sup> course students***  
***Module 5. Military therapy***

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## **Topic 1. Organization of therapeutic care in wartime and in peacetime emergencies.**

**Quantity of hours: 2.**

### **Topicality**

Therapeutic care in wartime is the necessary part of medical and evacuation support. The system of step therapy of wounded persons and patients with further their evacuation by appointment and medical rehabilitation is one of the links of evacuation support of the Armed Forces of Ukraine.

Wartime emergencies are related with the consequences of application of weapons of mass destruction (WMD) or conventional means of defeat, during which there is the appearance of secondary factors of population damage resulted by the damage of nuclear and hydroelectric stations, storages of radioactive and toxic substances, petroleum products, explosives, severe toxic substances, toxic wastes, transport and engineering communications.

In case of sudden appearance of emergencies all preparatory activities connected with organization of overcoming of medical and sanitary consequences must be done operatively according to their scales and character.

**The general aim** is the direct organization of therapeutic care in wartime and in peacetime emergencies included the link of organizational, medical, evacuation, sanitary, hygienic, and anti-epidemic and measures.

### **Specific goals**

Students must know:

The definition. General principles of therapeutic care organization in wartime. The characteristics of modern combat therapeutic pathology. Sanitary losses of therapeutic profile. Medical sorting of affected persons at the stages of first qualified and specialized therapeutic care in peacetime emergencies.

Students must be able to:

- create a plan of therapeutic care in wartime and in peacetime emergencies;
- substantiate the steps of therapeutic care based on its types and content;
- provide qualified therapeutic care for elimination of the results of wondings, prevention of its complications;
- provide the successful medical rehabilitation;
- assess of sanitary losses of therapeutic profile;
- provide the medical sorting of affected, wounded persons and patients for timely medical care and further evacuation;
- divide patients on groups according to necessary at this moment type of medical care, its order and place, types of transportation of affected persons.

### **Examples of control questions for doing tests during practical classes**

#### **1. What are the main principles of therapeutic care in wartime? :**

- A. Timeliness, straightness, and consistency.
- B. Separation of forces of therapeutic care between medical institutions.
- B. Evacuation of affected, wounded persons and patients in medical institution for further medical care.
- Г. The maximum possible using of medical aircraft as the fastest way of transporting of injured and sick persons to medical institutions.
- Д. Creating the defined documentation of reckoning and reporting.
- E. All answers are direct.

#### **2. What is the type of therapeutic care? :**

- A. The complex of treatment, preventive or evacuative measures for wounded and affected persons on one step of medical evacuation.
- B. The complex of treatment, preventive or evacuative measures for wounded and affected persons on different steps of medical evacuation.

#### **3. What is the content of therapeutic care? :**

- A. The complex of treatment, preventive or evacuative measures for wounded and affected persons on one step of medical evacuation.

B. The complex of treatment, preventive or evacuative measures for wounded and affected persons on different steps of medical evacuation.

**4. What are the immediate methods of qualified therapeutic care? :**

A. Antidotes.

Б. Pulmonary analeptics.

В. Artificial lung ventilation.

Г. Complete sanitary обработки of affected persons.

Д. All answers are direct.

Е. The direct answers are А, Б, В.

**5. What is the complex of measures connected with transportation of wounded and affected persons, patients from the region of sanitary losses appearance to medical institutions for timely and complete medical care:**

A. Medical sorting.

Б. Specialized therapeutic care.

В. Separation.

Г. Medical evacuation.

Д. Medical rehabilitation.

**6. What are the peculiarities of combat therapeutic pathology? :**

A. Massive sanitary losses.

Б. Quickly increase of severity of clinical features.

В. Combined character of damage.

Г. The direct answers are А and Б.

Д. The direct answers are Б and В.

Е. All answers are direct.

**7. When can the therapeutic care be provide? :**

A. In wartime.

Б. In wartime and in peacetime emergencies.

В. In peacetime emergencies.

**8. What are the types of medical sorting:**

A. Intra-point, evacuative and transport.

Б. Intra-point and evacuative.

В. Intra-point and transport.

Г. Evacuative and transport.

Д. The direct answer is absent.

**9. Is the writing of the results of medical sorting in medical documentation obligatory? :**

A. Yes.

Б. No.

**10. What patients are involved in the group of non-transportable persons? :**

A. With acute heart failure.

Б. With severe heart rhythm and conductive disorders.

В. Coma.

Г. All answers are direct..

Д. The direct answers are А and В.

Е. The direct answers are Б and В.

#### The answers on control questions

№ тесты	1	2	3	4	5	6	7	8	9	10
Answer	Е	В	А	Д	Г	Е	Б	А	А	Г

#### The main theoretical questions

1. General principles of therapeutic care organization in wartime.
2. Steps of therapeutic care.
3. The types and content of therapeutic care.
4. Medical evacuation: the definition, features of carrying out.

5. The groups of sanitary losses of therapeutic profile.
6. The medical sorting: the definition, types, principles, requirements.
7. Classification of groups of affected persons according to the necessity of medical care, the priority and the place of its provision, the type of transportation.

#### **The technological map of the lesson**

№	Step	minutes	Study-guides		The place of the lesson
			Study objectives	Equipment	
1	The assessment of primary levels by test-control	15	Tests		Classroom
2	Doing of situational tasks	35	Situational tasks		Classroom
3	The control speaking.	30	Control questions		Classroom

#### **References:**

1. Boissonnault W.G, Vanwye WR. Primary Care for the Physical Therapist: Examination and Triage. Elsevier Health Sciences, 2020. – 432 p.

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2. Classification and minimum standards of minimum standards for foreign medical teams in sudden onset disasters. World Health Organization. Geneva 27, Switzerland – 2013. – 103 p.

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3. DOD Dictionary of Military and Associated Terms. – 2021. – August – 358p.

<https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/dictionary.pdf>

4. Worldwide military medicine

<https://military-medicine.com/article/3665-aeromedical-evacuation.html>

### **Topic 2. Radiation-related disorders. Clinical characteristics of ionizing radiation. Pathogenesis of radiation sickness. Clinical classification of ionizing radiation, acute radiation sickness. The conception of radiation trauma, medical care on different steps of medical evacuation.**

**Quantity of hours: 4.**

#### **Topicality**

Since the atomic bombings of Hiroshima and Nagasaki, Japan, during World War II, most cases of radiation sickness have occurred after nuclear industrial accidents, such as the 1986 explosion and fire that damaged the nuclear power plant at Chernobyl, Ukraine.

**The general aim** is the learning of the radiation-related disorders on the human organism, knowing of protective measures, improvement of diagnostic in defined category of patients, their treatment and prevention of early and lately complications of radiation sickness.

#### **Specific goals**

Students must know:

The definition. The types of ionizing radiation, units of its measurement and dosimetry. The main links of biological effects of ionizing radiation and pathogenesis of the main clinical forms of radiation damage. The clinic, diagnostic and treatment of radiation trauma. The definition of acute radiation sickness.

The clinic and diagnostic of intestinal, toxic and cerebral form of acute radiation sickness. The peculiarities of radiation-related disorders in peacetime.

Students must be able to:

- define the content of medical care on different steps of medical evacuation during radiation-related disorders;
- do the diagnostic of radiation-related disorders;
- provide medical care during acute local and combined radiation-related;
- apply the technic of bone marrow aspiration;
- formulate the final clinical diagnosis and create the individual plan of treatment;
- do differential diagnostic of intestinal, toxic and cerebral form of acute radiation sickness;
- make the algorithm of medical care on different steps of medical evacuation.

### **Examples of control questions for doing tests during practical classes**

**1. What is the radiation consist of particles, X-rays, or gamma rays with sufficient energy to cause ionization in the medium through which it passes? :**

- A. Sun radiation.
- Б. Ionizing radiation.
- В. Warm radiation.

**2. What are the features of ionizing radiation? :**

- A. Penetrative;
- Б. Photochemical;
- В. Biological;
- Г. Cumulative;
- Д. The direct answers are A, Б, and В.
- Е. All answers are direct.

**3. What types of radiation doses can be? :**

- A. Absorbed, equivalent and effective.
- Б. Absorbed and equivalent.
- В. Equivalent and effective.
- Д. The direct answer is absent.

**4. What form is not connected with acute radiation sickness? :**

- A. Bone-marrow;
- Б. Hemorrhagic;
- В. Intestinal;
- Г. Vessel-toxic;
- Д. Cerebral.

**5. What is the most typical feature of pulmonary system during acute radiation sickness? :**

- A. Pulmonitis.
- Б. Pneumonia.
- В. Bronchitis.

**6. What laboratory indicator is connected with the severity of acute radiation sickness in first 2-3 days? :**

- A. Leukopenia;
- Б. Erithropenia;
- В. Limphopenia;
- Г. Thrombocytopenia;

**7. What is the duration of розпалу period of acute radiation sickness:**

- A. 2-4 days;
- Б. 2-4 weeks;
- В. 2-4 months;
- Г. The direct answer is absent.

**8. What positive sign of acute radiation sickness is more prognostic? :**

- A. Improvement of vision;
- Б. Improvement of arthritis;
- В. Improvement of the results of blood.

**9. The period of long-term consequences of acute radiation sickness is characterized by:**

- A. Astheno-vegetative, diencephalic syndrome;
- Б. Appearance of tumors;
- В. Appearance of eyes disorders;
- Г. The direct answers are Б and В;
- Д. All answers are direct.

**10. Is there the latent period of acute radiation sickness? :**

- A. Yes.
- Б. No.

**The answers on control questions**

№ of the test	1	2	3	4	5	6	7	8	9	10
Answer	Б	В	А	Б	А	В	Б	В	Д	А

**The main theoretical questions**

1. The definition of radiation-related disorders and ionizing radiation.
2. The types and peculiarities of ionizing radiation.
3. The peculiarities of dosimetry of ionizing radiation.
4. The main links of biological effects of ionizing radiation; stages of radiation damage.
5. Radio sensation of biological objects.
7. The definition of acute radiation sickness.
8. The main links of pathogenesis of acute radiation sickness.
9. The classification of acute radiation sickness according to clinical forms, severity, presence of coexistent disorders.
10. The peculiarities of clinic and diagnostic of intestinal, toxic and cerebral form of acute radiation sickness.
11. The definition of radiation trauma.
12. The characteristic of radiation damage in peacetime emergencies.

**The technological map of the lesson**

№	Step	minutes	Study-guides		The place of the lesson
			Learning objectives	Equipment	
1	The assessment of primary levels by test-control	15	Tests		Classroom
2	Doing of situational tasks	80	Situational tasks		Classroom
3	The control speaking.	65	Control questions		Classroom

**References:**

1. Ionizing radiation-induced circulatory and metabolic diseases. Tapio S, Little MP, Kaiser JC, and Salomaa S / Environment International. – 2021. – January. – Vol. 146, 106235 <https://www.sciencedirect.com/science/article/pii/S0160412020321905>
2. Acute radiation syndrome. A Brochure for Physicians. <https://www.cdc.gov/nceh/radiation/emergencies/pdf/ars.pdf>
3. Follow-up of delayed health consequences of acute accidental radiation exposure. Lessons to be learned from their medical management / Radiation Safety Section. International Atomic Energy Agency Wagramer Strassa 5, Vienna, Austria. – 2002. – 138 p. [https://lecturedsumdu.blob.core.windows.net/nodes/7174/3ae89612-3980-11ec-9225-005056827921/acute\\_radiation\\_sickness.pdf](https://lecturedsumdu.blob.core.windows.net/nodes/7174/3ae89612-3980-11ec-9225-005056827921/acute_radiation_sickness.pdf)

4. U.S. Department of Veterans Affairs.

<https://www.publichealth.va.gov/exposures/radiation/diseases.asp>

5. DOD Dictionary of Military and Associated Terms. – 2021. – August – 358p.

<https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/dictionary.pdf>

### **Topic 3. Acute radiation sickness. Bone marrow form of acute radiation sickness Clinic and diagnostic.**

**Quantity of hours: 2.**

#### **Topicality**

Acute radiation syndrome or acute radiation sickness is one of the most challenging aspects of a public health and medical response to a nuclear or radiological incident. This condition is the result of a large exposure to a penetrating external radiation source over a short period of time.

**The general aim** is the ability to make a preliminary diagnosis and determine the management of patients with bone marrow form of acute radiation sickness in different periods of sickness.

#### **Specific goals**

##### **Students must know:**

Classification of bone marrow form of acute radiation sickness. Clinical features in different periods of sickness. Differential and diagnostic criteria of degrees of severity of acute radiation sickness. Determination of life-threatening conditions in each period of the disease.

Students must be able to:

- determine the form and severity of acute radiation sickness;
- carry out timely diagnostics of acute radiation sickness;
- do the clinical examination of the patients;
- create the plan of management for patients with bone marrow form of acute radiation sickness.

### **Examples of control questions for doing tests during practical classes**

**1. What are the degrees of severity of acute radiation sickness according to the changes in blood?:**

- A. I, II.
- Б. I, II, III.
- В. I, II, III, IV.
- Г. I, II, III, IV, V.

**2. What are the periods of acute radiation sickness?:**

- A. Primary
- Б. Latent.
- В. Period of intensive clinical features.
- Г. Progression, stabilization, early recovering (complete or partially).
- Д. Period of long-term consequences.
- Е. The direct answers are А, Б, В, and Д.
- Ж. All answers are direct.

**3. What is the duration of primary period of acute radiation sickness? :**

- A. Hours.
- Б. Days.
- В. Months.
- Г. Years.
- Д. All answers are direct.

**4. What is the main symptom of primary period of acute radiation sickness? :**

- A. Bleeding.
- Б. Vomiting.
- В. Fever.
- Г. The direct answer is absent.

**5. What are the long-term consequences for patients with acute radiation sickness? :**

- A. Somatic.

Б. Genetic.

В. Somatic and genetic.

Г. The direct answer is absent.

**6. What dose of radiation is associated with the start of bone marrow form of acute radiation sickness? :**

А. 1-10 Gr.

Б. 10-20 Gr.

В. 20-30 Gr.

Г. 30-40 Gr.

**7. With what severity of bone marrow form of acute radiation sickness is frequentative vomiting associated?:**

А. Mild.

Б. Moderate.

В. Severe.

Г. Very severe.

**8. With what severity of bone marrow form of acute radiation sickness is intensive headache associated?:**

А. Mild.

Б. Moderate.

В. Severe.

Г. Very severe.

**9. With what severity of bone marrow form of acute radiation sickness is intensive headache associated?:**

А. Mild.

Б. Moderate.

В. Severe.

Г. Very severe.

**10. With what severity of bone marrow form of acute radiation sickness is single vomiting associated?:**

А. Mild.

Б. Moderate.

В. Severe.

Г. Very severe.

#### The answers on control questions

№	1	2	3	4	5	6	7	8	9	10
Answers	В	Ж	А	Б	В	А	В	В	Г	А

#### The main theoretical questions

1. The classification of bone marrow form of acute radiation sickness according to the severity.
2. The main syndromes of bone marrow form of acute radiation sickness.
3. Diagnostic methods of bone marrow form of acute radiation sickness.
4. Differential diagnosis of bone marrow form of acute radiation sickness.

#### The technological map of the lesson

№	Step	Time, minutes	Study-guides		The place of the lesson
			Learning objectives	Equipment	
1	The assessment of primary levels by test-control.	15	tasks		Classroom
2	Doing of situational tasks.	35	Situational tasks		Classroom
3	The control speaking.	30	tasks		Classroom



## References:

1. Ionizing radiation-induced circulatory and metabolic diseases. Tapio S, Little MP, Kaiser JC, and Salomaa S / Environment International. – 2021. – January. – Vol. 146, 106235. <https://www.sciencedirect.com/science/article/pii/S0160412020321905>
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5. DOD Dictionary of Military and Associated Terms. – 2021. – August – 358p. <https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/dictionary.pdf>

## **Topic 4. Step therapy of patients with acute radiation sickness. Atypical forms of acute radiation sickness.**

### **Quantity of hours: 2.**

#### **Topicality**

Acute radiation sickness is a complex of syndromes developed in human due to short-duration whole body exposure to ionizing radiation with doses higher than 0.7–1.0 Gy. The most common and important syndromes are bone marrow syndrome (dose from 0.7 to 10.0 Gy), gastrointestinal syndrome (above 8.0 Gy), cardiovascular syndrome (above 20.0 Gy), central nervous system (or neurological) syndrome (above 80.0 Gy), and cutaneous (skin) syndrome (above 10.0 Gy). The severity as well as significance of each syndrome in any particular case of ARS depends on the dose of exposure and distribution of the absorbed dose within the body. Radiation injury to other organs, such as oral mucous, lungs, heart, and eye, is also possible under some circumstances.

**The general aim** is the ability to make a diagnosis of acute radiation sickness in time and prescribe treatment in different periods of disease.

#### **Specific goals**

#### **Students must know:**

The definition. The principles of pathogenetic treatment of acute radiation sickness according to the main features. The content of medical care for affected by ionized radiation persons on different steps of medical care. The types of atypical forms of acute radiation sickness. Clinical features of acute radiation sickness in the case of external uneven irradiation, radiation combined injury, internal irradiation, coexistent irradiation, neutron radiation damage, prolonged small doses irradiation. Medical care on different steps of medical evacuation in the case of atypical forms of acute radiation sickness.

Students must be able to:

- collect anamnesis and analyze it;
- determine the diagnostic criteria of atypical forms of acute radiation sickness;
- do clinical examination of patients with atypical forms of acute radiation sickness;
- do differential diagnostic between typical and atypical forms of acute radiation sickness;
- create the algorithm of medical care on different steps of medical evacuation for atypical forms of acute radiation sickness;
- do measures of first medical and qualified therapeutic care for persons with different forms of radiation disorders.

## **Examples of control questions for doing tests during practical classes**

**1. What is the effective drug for symptomatic treatment of vomiting in patients with acute radiation sickness? :**

- A. Metoclopramide.
- B. Ondansetron
- B. All answers are direct.
- Г. The direct answer is absent.

**2. What vitamin is the most effective antioxidant for treatment of acute radiation sickness? :**

- A. A
- Б. B6.
- В. C.
- Г. E.

**3. What is direct?**

- A. The general principles and directions of treatment of acute radiation sickness at uniform and uneven irradiation are basically similar.
- Б. The general principles and directions of treatment of acute radiation sickness at uniform and uneven irradiation are basically different.
- В. The direct answer is absent.

**4. Which drug is a serotonin receptor blocker? :**

- A. Ondansetron.
- Б. Metoclopramide.
- В. Methocinia iodide.
- Г. Aminazine.

**5. Which drug belongs to the dopamine receptor blockers of the critical zone of the vomiting center? :**

- A. Ondansetron.
- Б. Metoclopramide.
- В. Methocinia iodide.
- Г. Aminazine.

**6. Which treatment for hemorrhagic syndrome is more appropriate in patients with acute radiation sickness? :**

- A. Transfusion of erythrocyte mass.
- Б. Platelet transfusion.
- В. Infusion of aminocaproic acid.

**7. What methods are contraindicated in early step of recovering in patients with acute radiation sickness? :**

- A. Tanning.
- Б. Electrical procedures.
- В. Ultraviolet radiation.
- Г. All answers are direct.
- Д. The direct answer is absent.

**8. Is it appropriate to rehabilitate patients with acute radiation sickness in resorts after clinical recovery? :**

- A. Yes.
- Б. No.

**9. The degree of what effects is associated with the dose of ionization? :**

- A. Non-stochastic (determined).
- Б. Stochastic (non-determined).

**10. The long-term effects of radiation exposure include :**

- A. Oncological pathology;
- Б. Pulmonary diseases;
- В. Digestive organs diseases;
- Г. Urinary tract disorders.

### The answers on control questions.

<b>№ of the test</b>	1	2	3	4	5	6	7	8	9	10
<b>Answer</b>	B	Г	A	A	Б	Б	Г	A	A	A

### The main theoretical questions.

1. The content of medical care for affected by ionized radiation persons on different steps of medical evacuation.
2. The content of the first, pre-medical, first medical, qualified and specialized medical care.
3. Principles of pathogenetic treatment of acute radiation sickness.
4. The classification of atypical forms of acute radiation sickness.
5. Clinical features of acute radiation sickness in the case of external uneven, internal and combined irradiation.
6. The symptoms of acute radiation sickness in the case of combined radiation and neutron radiation damage.
7. The key links of the effects of prolonged small doses irradiation.
8. The prevention of acute radiation sickness.

### The technological map of the lesson

№	Step	minutes	Study-guides		The place of the lesson
			Learning objectives	Equipment	
1	The assessment of primary levels by test-control.	15	Tests		Classroom
2	Doing of situational tasks.	35	Situational tasks		Classroom
3	The control speaking.	30	Control speaking		Classroom

### References:

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1. Ionizing radiation-induced circulatory and metabolic diseases. Tapio S, Little MP, Kaiser JC, and Salomaa S / Environment International. – 2021. – January. – Vol. 146, 106235  
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[https://lecturesumdu.blob.core.windows.net/nodes/7174/3ae89612-3980-11ec-9225-005056827921/acute\\_radiation\\_sickness.pdf](https://lecturesumdu.blob.core.windows.net/nodes/7174/3ae89612-3980-11ec-9225-005056827921/acute_radiation_sickness.pdf)
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## Topic 5. Internal organs damage during combat surgical trauma and injuries during peacetime catastrophes and accidents.

**Quantity of hours: 4.**

**Topicality**

During World War II (WWII), Dr. Robert Zollinger of the US Army proposed the concept of mobile surgical units that were capable of performing 100 major operations on combat casualties near the front lines before being resupplied. War-related injury is a major public health concern, and a leading cause of mortality, morbidity, and disability globally, particularly in low and middle-income countries.

**The general aim** is the ability to make a diagnosis and treatment of internal organs in wounded persons resulted from combat trauma.

### **Specific goals**

#### **Students must know:**

Classification of pathological changes of internal organs in wounded persons. Syndromes of gunshot wound. Diseases of respiratory organs in wounded persons. Diseases of circulatory organs in wounded persons. Diseases of digestive organs in wounded persons. Kidney disorders in wounded persons. Treatment of internal organs diseases in wounded persons on different steps of medical evacuation. Prevention of internal organs diseases in wounded persons.

Students must be able to:

- collect anamnesis and analyze it;
- to treat the disorders of digestive organs, lungs, kidneys, cardiovascular system in wounded persons;
- do clinical examination of wounded patients;
- diagnose the tricky pressure syndrome;
- create the algorithm of medical care on different steps of medical evacuation for tricky pressure syndrome;
- do measures of first medical and qualified therapeutic care for wounded persons.

## **Examples of control questions for doing tests during practical classes**

### **1. Pericarditis is the:**

- A. Early complication of penetrating chest injuries.
- Б. Late complication of penetrating chest injuries.
- В. Atypical complication of penetrating chest injuries.
- Г. The direct answer is absent.

### **2. What are the characteristic signs of pericarditis? :**

- A. Precardiac pain with different severity increased by breathing, coughing, movements, with irradiation to the left shoulder or neck.
- Б. Pericardial friction noise.
- В. The direct answer is absent.
- Г. All answers are direct.

### **3. What is direct in the case of myocardopathy? :**

- A. Develops due to penetration of the chest at an early stage (first 5 days).
- Б. It is appeared in a later period due to hypoxia, anemia, sepsis, exhaustion.
- В. All answers are direct.

### **4. After how many weeks of injury myocarditis develops?:**

- A. 1-2.
- Б. 3-4.
- В. 5-6.
- Г. 7-8.

### **5. What disease most often occurs as a complication of catheterization of large veins during long-term infusion therapy? :**

- A. Infective endocarditis.
- Б. Shock.
- В. Traumatic coma.
- Г. Infective myocarditis.

### **6. What are the signs of oligoanuric phase of acute renal failure? :**

- A. Oliguria.
- Б. Vomiting.

B. All are direct.

Г. All are not direct.

**7. What are the characteristics of pulmonary system disorders in wounded persons?:**

A. Pulmonitis, hemorrhage in the lungs.

Б. Pulmonitis, hemorrhage in the lungs, atelectasis.

В. Pulmonitis, hemorrhage in the lungs, atelectasis, pneumonia.

Г. Pulmonitis, hemorrhage in the lungs, atelectasis, pneumonia, purulent diseases of the lungs and pleura.

**8. What are the main signs of syndrome of prolonged tissue compression? :**

A. Acute renal and hepatic failure + anemia.

Б. Hypovolemic shock + acute renal failure + anemia.

В. Acute renal and hepatic failure + pulmonary edema.

Г. Anemia + pulmonary edema + hypovolemic shock.

Д. Consciousness disorders + anemia.

**9. What is the main sign of the dearth of cells after prolonged compression:**

A. Areflexia.

Б. Absence of active movements.

В. Septicotoxemia.

Г. Absence of passive movements.

Д. Absence of sensitivity.

**10. Affected persons of the first group received medical because of:**

A. Vital indications.

Б. As a second step.

В. As a third step.

**The answers on control questions**

№	1	2	3	4	5	6	7	8	9	10
Answer	A	Г	Б	Б	A	Б	Г	Г	Б	A

**The main theoretical questions.**

1. Classification of pathological changes of internal organs in wounded persons.

2. General syndromes of gunshot wound.

3. Diseases of respiratory organs in wounded persons.

4. Diseases of circulatory organs in wounded persons.

5. Peculiarities of digestive organs disorders in wounded persons.

6. Kidney diseases in wounded persons.

7. Treatment of internal organs diseases in wounded persons on different steps of medical evacuation.

8. Prevention of internal organs diseases in wounded persons.

9. Tricky Hazard Syndrome: etiology, pathogenesis, classification.

10. The treatment of Tricky Hazard Syndrome on different steps of medical evacuation.

**The technological map of the lesson**

№	Step	minutes	Study-guides		The place of the lesson
			Learning objectives	Equipment	
1	The assessment of primary levels by test-control.	15	Tests		Classroom
2	Doing of situational tasks.	80	Situational tasks		Classroom
3	The control speaking. Summarizing of the results	65	Control questions		Classroom

## References:

1. Military Trauma and Surgical Procedures in Conflict Area: A Review for the Utilization of Forward Surgical Team / Cai YL, Ju JT, Liu WB, Jian Zhang J.// Military Medicine. – 2018. – Vol. 183(3-4). – P. 97–106. <https://doi.org/10.1093/milmed/usx048>
2. DOD Dictionary of Military and Associated Terms. – 2021. – August – 358p. <https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/dictionary.pdf>

## **Topic 6. Emergencies, therapeutic care for life-threatening conditions during different steps of medical evacuation. Poisonous substances injury in wartime and in peacetime.**

**Quantity of hours: 2.**

### **Topicality**

Poisoning can be defined as an interaction between a foreign chemical (toxin) and a biological system that results in damage to a living organism. In general, the medical profession has been more concerned with the acute effects of toxins and the clinical management of toxicity, but chronic effects of toxins have much more importance on a global scale.

### **Specific goals**

#### **Students must know:**

General characteristics of poisonous substances injury, classification, diagnostic. Step treatment of poisonous substances injury in wartime. The organization of emergency therapeutic care in the case of acute poisoning in different steps of medical evacuation. The peculiarities of poisonous substances injury in wartime and in peacetime. The content of medical care.

Students must be able to:

- collect anamnesis and analyze it;
- do clinical examination of affected persons;
- do differential diagnostic of different poisonous substances injury;
- create the algorithm of medical care on different steps of treatment for poisonous substances injury during wartime;
- provide the therapeutic care for persons with poisonous substances injury on different steps of medical evacuation;
- do the antidote therapy in the case of acute poisoning.

## **Examples of control questions for doing tests during practical classes**

### **1. What are belonged to poisoning substances? :**

- A. Insecticides.
- Б. Herbicides.
- В. Afficides.
- Г. All answers are direct.
- Д. The direct answer is absent.

### **2. What degree of poisoning is characterized by increased salivation, bronchorrhea, vomiting, diarrhea, narrowing of the pupils, bronchospastic syndrome, cramp-like abdominal ?:**

- A. I.
- Б. II.
- В. III.

### **3. What degree of poisoning is characterized by pronounced miosis and hyperhidrosis, paralysis, the development of coma?**

- A. I
- Б. II
- В. III

### **4. What is belong to organochlorine substance? :**

- A. Hexabenzene.
- Б. Atropine.
- В. Calcium gluconate.

**5. To which group of toxic substances belongs hydrocyanic acid?**

- A. Organophosphorus compounds.  
 B. Organochlorine compounds.  
 B. Cyanides.  
 Г. Asphyxiating gases.

**6. What are the main symptoms of acute nitrogen poisoning? :**

- A. Nasal bleeding, sore throat, cough, wheezing, redness and tingling in the eyes.  
 B. Shortness of breath, vomiting, dizziness, intoxication, loss of consciousness and deep coma.  
 B. Vomiting, metallic taste in the mouth, severe abdominal pain.

**7. What are the main symptoms of acute arsenic poisoning? :**

- A. Nasal bleeding, sore throat, cough, wheezing, redness and tingling in the eyes.  
 B. Shortness of breath, vomiting, dizziness, intoxication, loss of consciousness and deep coma.  
 B. Vomiting, metallic taste in the mouth, severe abdominal pain.

**8. What are the main symptoms of acute organochlorine poisoning? :**

- A. Nasal bleeding, sore throat, cough, wheezing, redness and tingling in the eyes.  
 B. Shortness of breath, vomiting, dizziness, intoxication, loss of consciousness and deep coma.  
 B. Vomiting, metallic taste in the mouth, severe abdominal pain.

**9. What is the first-line treatment for alkali poisoning? :**

- A. Immediate gastric lavage.  
 B. Unithiol.  
 B. Artificial lung ventilation.

**10. What is the pathognomonic sign of gasoline poisoning? :**

- A. «Gasoline sore throat».  
 B. «Gasoline gastritis».  
 B. «Gasoline pneumonia».

**The answers on control questions**

№ recry	1	2	3	4	5	6	7	8	9	10
Answer	Г	A	B	A	B	Б	B	A	A	B

**The main theoretical questions.**

1. General characteristics of poisonous substances.
2. Classification of poisonous substances.
3. The groups of poisonous substances.
4. The main clinical features of poisonous substances.
5. The diagnostic criteria of poisonous substances damage.
6. Step treatment of poisonous substances injury in wartime.
7. The organization of emergency therapeutic care in the case of acute poisoning in different steps of medical evacuation.
8. The main features of antidote therapy in the case of acute poisoning.
9. The peculiarities of poisonous substances injury in peacetime on the chemical factories.

**The technological map of the lesson**

№	Step	time, minutes	Study-guides		The place of the lesson
			Learning objectives	Equipment	
1	The assessment of primary levels by test-control.	15	Tests		Classroom
2	Doing of situational tasks.	35	Situational tasks		Classroom
3	The control speaking. Summarizing of the results	30	Control questions		Classroom

## References:

1. Ministry of Health. 2019. The Investigation and Surveillance of Poisoning and Hazardous-substance Injuries: Guidelines for public health units (4th edn). Wellington: Ministry of Health.  
<https://www.health.govt.nz/system/files/documents/publications/investigation-surveillance-poisoning-hazardous-substance-injuries-guidelines-public-health-units-mar2019.pdf>
2. Inhalation Injury and Toxic Industrial Chemical Exposure. Saeed O., Boyer NL, Pamplin JC, ... Cancio LC. Military Medicine, Volume 183, Issue suppl\_2, September-October 2018, Pages 130–132, <https://doi.org/10.1093/milmed/usy073>
3. DOD Dictionary of Military and Associated Terms. – 2021. – August – 358p.  
<https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/dictionary.pdf>

## Topic 7. Diseases caused by the action of thermal factors (warm and cold).

### Quantity of hours: 2.

#### Topicality

The National Center for Health Statistics found that 63% of these were attributed to exposure to excessive or prolonged natural cold, hypothermia, or both; whereas 31% were attributed to exposure to excessive natural heat, heat stroke, or sun stroke. As these statistics were gathered from death certificates, the numbers may underestimate the true incidence of fatal thermoregulatory catastrophe.

**The general aim** is the the ability to diagnose and provide medical care for patients with overheating, heat stroke, frostbite and freezing.

#### Specific goals

#### Students must know:

Definition of overheating and hypothermia. Changes in internal organs during the influence of warm. Peculiarities of clinic, diagnostic. Prevention and step therapy. Changes in internal organs in cold influence. Peculiarities of clinic, diagnostic. Prevention and step therapy. Burn disease, definition, and classification. Pathogenesis of the main clinical features and complications during different periods of diseases. Typical complications of burn disease, diagnostic. Step therapy of burn disease. Peculiarities of treatment of burn shock.

Students must be able to:

- collect anamnesis and analyze it;
- do clinical examination of persons with overheating and frostbite;
- diagnose the main types of thermal injury;
- determine the surface of burn according to the «rule of nines» and «rule of palm»;
- diagnose the deep of the burn;
- evaluate the prognosis of the severity of the burn;
- create the algorithm of medical care on different steps of treatment of overheating and supercooling;
- prevent the complications of internal organs during thermal factors;
- determine the content of treatment and preventive measures in patients with supercooling.

## Examples of control questions for doing tests during practical classes

### 1. The highest mortality is observed at:

- A. Heat (sun) shock.
- B. Thermal edema of the legs and feet.
- B. Thermal depletion due to the loss of salts in the body.
- Г. Thermal depletion due to dehydration.

### 2. Treatment of thermal collapse includes the administration of:

- A. Mezaton and cordiamine
- B. Atropine and diphenhydramine.
- B. Nitrosorbide.
- Г. Unithiol.

### 3. What are the types of thermal exhaustion? :

- A. Exhaustion resulted from excessive water loss through the body.



B. Exhaustion resulted from excessive salt loss through the body.

B. All answers are direct.

**4. How can we assess the surface of the burn? :**

A. «Rule of nines for burns».

B. «Rule of palms».

B. All answers are direct.

**5. Which disease is a frequent consequence of prolonged cooling of the extremities? :**

A. Obliterative endarteritis.

B. Wet eczema.

B. Dermatitis.

**The answers on control questions.**

<b>№ recty</b>	1	2	3	4	5
<b>Answer</b>	A	A	B	B	A

**The main theoretical questions.**

1. Definition of overheating.
2. The causes and pathogenetic links of overheating.
3. The diagnostic of overheating.
4. Changes in internal organs damage during the influence of warm.
5. The peculiarities of preventive and step treatment of diseases caused by the action of thermal factors **in** wartime and in peacetime.
6. The definition of burn disease.
7. Pathogenetic links of burn disease.
8. Pathogenesis of the main clinical features and complications during different periods of burn disease
9. Typical complications of burn disease, diagnostic.
10. Step therapy of burn disease.
11. The main principles of treatment of burn shock.
12. Changes in internal organs in cold influence.
13. Peculiarities of clinic and diagnostic.
14. Prevention and step therapy.

**The technological map of the lesson**

№	Step	Minutes	Study-guides		The place of the lesson
			Learning objectives	Equipment	
1	The assessment of primary levels by test-control.	15	Tests		Classroom
2	Doing of situational tasks.	30	Situational tasks		Classroom
3	The control speaking. Summarizing of the results	35	Control questions		Classroom

**References:**

1. William P. Thermoregulatory disorders and illness related to heat and cold stress / William P., Cheshire Jr. / Autonomic Neuroscience // 2016. – April – Vol. 196. – P. 91-104.  
<https://doi.org/10.1016/j.autneu.2016.01.001>
2. Burn disease <https://stanfordhealthcare.org/medical-conditions/skin-hair-and-nails/burns/stages.html>
3. WHO. Management of Burns.  
[https://www.who.int/surgery/publications/Burns\\_management.pdf](https://www.who.int/surgery/publications/Burns_management.pdf)
4. Burn evaluation and management. Schaefer TJ; Szymanski KD. 2021. – August 11.  
<https://www.ncbi.nlm.nih.gov/books/NBK430741/>



