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## TOPICS AND QUESTIONS

for **practical classes** on Medicine of Extreme Situations for 4<sup>th</sup> year students

### Lesson 1.

#### **Topic 3.5. Poisonous and toxic substances with neuromuscular effects.**

Poisonous substances with convulsive action – cholinesterase inhibitors: organophosphorus chemical agents, carbamates. Anticholinesterase, direct (acetylcholine) and the sensitizing effect of organophosphorus compounds. Muscarinic and nicotinic effects in clinics of injuries. The pathogenesis of disorders of the central nervous system, respiratory, cardiovascular, gastrointestinal, metabolic, endocrine system. Clinic and diagnostics of certain forms of lesions (light, medium, heavy). The main causes of death, complications and consequences of lesions.

Poisonous and toxic substances with paralytic action – botulinus toxin, saxitoxin, tetrodotoxin. Emergency medical care at the medical evacuation stages. The main methods of antidote therapy (cholinolytics and reactivators of cholinesterase). Staged treatment. Prognosis.

#### **Topic 3.8. Poisonous and toxic substances with lung-toxic and irritating action.**

The main forms of the destruction of respiratory system: inflammation of the respiratory tract (acute laryngitis and bronchitis) and lung parenchyma (toxic pneumonitis), and toxic pulmonary edema (toxic respiratory distress syndrome).

Poisonous and toxic substances with asphyxiating action: phosgene and diphosgene. The mechanism of the toxic effect. Clinic and diagnostics of lesions. Emergency medical care and treatment in different periods of lesion. Control of hypoxia, blood circulation defects and other manifestations of the lesion. The volume of medical care at the medical evacuation stages. Prognosis.

### Lesson 2.

#### **Topic 3.7. Poisonous and toxic substance with cytotoxic effect.**

Inhibitors of protein synthesis and cell division – mustards, ricin. Toxicological characterization of mustards. Pathogenesis. Clinical characteristics of lesions by sulfur mustard gas of the skin, eyes, respiratory and digestive system. Symptoms of resorptive action of mustards. Clinical features of lesions by nitrogen mustard.

Thiol poisons – arsenic compounds. Lewisite. Toxicological characteristic. Pathogenesis. The clinical picture of lesions of the skin, eyes, respiratory and digestive system. Symptoms of resorptive action. Diagnostics.

Thiol poisons – toxic modifiers of plastic exchange. Dioxins. Toxicity. The main manifestations of acute intoxication. General principles of treatment of persons affected by mustard and lewisite. Volume of the therapeutic aid at medical evacuation stages. Prognosis.

#### **Topic 3.11. Clinical manifestations and diagnostics of lesions by poisons of animal and vegetative origin. Emergency medical care and treatment.**

General characteristics of poisons and toxins of vegetative and animal origin, their classification according to the degree of toxicity.

Clinic and diagnosis of lesions by poisonous plants: henbane, stramonium, hemlock, hellebore Lobel, bitter-sweet nightshade, mezezon, buttercup, opiates, cannabis, cocaine, marijuana.

Clinic and diagnosis of lesions by poisonous mushrooms.

Clinic and diagnosis of lesions of poisonous insects, poisonous snakes, amphibians. Volume of care in these lesions on the stages of medical evacuation. Prognosis.

### **Lesson 3.**

#### **Topic 3.9. Poisonous and toxic substances with general poisoning action.**

Toxicological characterization of hydrocyanic acid, cyanides and carbon monoxide. Pathogenesis and clinical characteristics of forms of lesions. Features of clinical manifestations during poisoning by chlorocyanogen. The main methods of antidote therapy. Antidotes. Symptomatic therapy. Staged treatment. Prognosis.

**Subject 3.10. The clinical picture of lesions by high-toxic substances and technical liquids, which widespread in factories and in the army. Providing emergency medical care. The volume of medical care in the medical evacuation stages.**

Toxicological characterization of widespread technical liquids: methanol, ethylene glycol, carbon tetrachloride, dichloroethane.

The clinical picture of lesions of ethanol and its substitutes, emergency medical care, medical aid at the medical evacuation stages, prognosis.

Diagnosis of poisoning by high-toxic substances. Syndrome characterization of high-toxic substances. Principles of treatment, prevention of poisoning.

### **Lesson 4.**

**Subject 3.10. The clinical picture of lesions by high-toxic substances and technical liquids, which widespread in factories and in the army. Providing emergency medical care. The volume of medical care in the medical evacuation stages.**

Toxicological characteristic of widespread high-toxic substances (ammonia, chlorine, trichloroethylene, hydrogen sulfide, hydrogen peroxide, carbon disulfide, acrylonitrile, sulfuric acid and hydrochloric acid, sulfur oxides, nitrogen oxides).

The clinical picture of lesions of ethanol and its substitutes, emergency medical care, medical aid at the medical evacuation stages, prognosis.

Diagnosis of poisoning by high-toxic substances. Syndrome characterization of high-toxic substances. Principles of treatment, prevention of poisoning.

#### **Topic 2.1. Characteristics of damaging factors in nuclear explosions.**

The concept of nuclear weapons and its types. Characteristics of damaging factors of nuclear explosion. Non-radiation factors of the nuclear explosion. Radiation factors of nuclear explosion.

Classification of radiation injuries. Radiation injuries from external exposure. Radiation injuries from internal exposure.

### **Lesson 5.**

#### **Topic 2.3. Medical protectors from chemical and radiation injuries.**

Health protectors from chemical damages (antidotes). The main groups of antidotes, their mechanism of action.

Health protection against external radiation. The main groups of radioprotectors. The mechanism of radioprotective effect of radioprotectors. Remedies of long-term maintenance of increased radioresistance of the organism. Remedies for prevention of primary reaction to radiation. Remedies for pre-hospital treatment of acute radiation syndrome.

#### **Topic 2.4. Tools for radiation detection, radiometric and dosimetric control.**

The goal of radiation detection and radiometric control. Technical equipment for radiation detection and radiation monitoring (DP-5V, DP-64). The characteristics of the device, and work instructions for the devices of radiation reconnaissance, monitoring of radioactive contamination and measurement of radiation doses (DCP-50A, ID-1, ID-11).

Organizing and conducting of monitoring of radiation doses at the stages of medical evacuation. The organization and carrying out of examination of food and water on contamination

with radioactive substances. Permissible values of radioactive contamination of various objects. Methods of measuring and calculating the degree of contamination on the surface of various objects (medical equipment, food, water).

## **Lesson 6.**

### **Topic 2.5. Tools for chemical detection and indication of toxic substances.**

The goal and tasks of chemical reconnaissance. Methods of indicating of toxic substances. Technical equipment for chemical detection and indication of toxic substances in the field conditions: indication film (IF-1), the military unit of the chemical reconnaissance (MUCR), gas detector (GSP-11), their characteristics and configuration.

### **Topic 2.7. Bases of evaluation of chemical situation.**

Purpose and methods for assessing the chemical situation. Initial data for the evaluation of chemical situation for the organization of emergency medical assistance in emergency situations.

### **Topic 2.6. Decontamination.**

Types of decontamination. Ways and methods of disinfection used during decontamination. Technical equipment for decontamination.

Organization of decontamination at the stages of medical evacuation. Organization of the site for the partial decontamination. Organization of the site for complete decontamination at the stages of medical evacuation. Security measures during decontamination.

## **Lesson 7.**

### **Topic 2.2. Technical equipment for individual and collective protection.**

Classification of technical devices for individual protection. Personal devices for protection of respiratory system; their operational, physiological and hygienic characteristics.

Medical monitoring of the gas-protection training. The use of individual respiratory protective equipment at the stages of medical evacuation.

Personal devices for skin protection; operational, their physiological and hygienic characteristics.

Collective protective equipment: appropriation and configuration. Sanitary requirements for medical shelters.

### **Topic 2.8. Field oxygen equipment and resuscitation equipment.**

Types of hypoxia in lesions of toxic substances. Classification of the field oxygen equipment and resuscitation equipment. Ventilator (AP-1, PD-9, DP-10), purpose, principles of work, instructions. Inhalers (OI-4); the characteristics, principles of work, instructions.

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