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FEATURES OF CONDUCTING ANTI-EPIDEMIC MEASURES IN CASES OF EMERGENCIES IN PEACE UNDER CONDITIONS OF QUARANTINE INFECTIONS. ANTI-EPIDEMIC PROTECTION OF THE TROOPS, BACTERIOLOGICAL INTELLIGENCE

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Introduction

Emergencies (EM) are associated with various types of disasters, man-made and natural disasters, wars. They contribute to the emergence of epidemics, increase the level of infectious diseases among the affected population. Emergencies for the sanitary-epidemiological service are abrupt, often unforeseen changes in the normal situation that have arisen as a result of the catastrophe and its consequences.

Emergencies are characterized by numerous human casualties, mass diseases and injuries, a sharp deterioration of the sanitary and epidemiological situation, a difficult epidemic situation. The population is deprived of housing, electricity, drinking water, the sewerage system is destroyed, the work of bath and laundry facilities is disrupted, and the organization of food is deteriorating.

During this period there is a sharp deterioration of social life conditions and life of the population, there is a large number of mechanical injuries, burns and other injuries, which significantly reduces the body's natural resistance, stress and other phenomena. Significant deterioration of the sanitary and epidemiological situation exacerbates the epidemic situation with regard to infectious diseases, as potential sources of infection are not isolated and dangerous to humans. When ecological systems are disturbed, it is possible to "revive" natural foci of especially dangerous infections (tularemia, plague, anthrax, etc.) and to spread them. The presence in laboratories and the accumulation in some countries of bacterial agents as biological weapons do not preclude their use in emergency situations.

At present, on all continents of the earth continues to operate a large number of hazardous facilities with reserves of radioactive substances, toxic and explosives, which will be enough to cause irreparable damage to the environment and even to completely destroy life on earth.

Major accidents, catastrophes have no national borders, lead to the death of people, have huge environmental and economic consequences and create socio-political tensions. In this regard, the prevention, forecasting and elimination of the consequences of emergencies, accidents resulting from catastrophes, and natural

disasters are of great social and economic importance. All this requires rapid changes in the organization and the usual rhythm of government agencies work, treatment and prevention and sanitary and epidemiological institutions.

The organization and conduct of sanitary and hygienic, anti-epidemic measures together with medical and evacuation in the general system of liquidation medical and sanitary consequences of emergencies is important for the preservation of life, health and efficiency of the affected population.

The law of Ukraine "On Civil Defense" states that the warning emergencies of natural and man-made nature, elimination of their consequences, the maximum reduction of losses is a state problem and the main tasks of the executive authorities and management at all levels. The Resolution of the Cabinet of Ministers of Ukraine № 1099 of July 15, 1998 "On the Procedure for Classification of Emergencies" approved the "Regulations on the Classification of Emergencies".

Abbreviations

ADT – diphtheria -tetanus anatoxin

ADT-R – diphtheria-tetanus anatoxin with reduced content antigen

BW – biological weapons

BPA – biological pathogen agents

MML – military medical laboratory

WHO - World Health Organization

MFIDH – military field infectious disease hospital

SSES – State Sanitary and Epidemiological Service

FPS – field paramedic set

MFL – medical field laboratory

MB – medical brigade

MH – Ministry of Health

MP – medical point

MPR – medical point of the regiment

EAEC – emergency anti-epidemic commission

EDI – especially dangerous infections

PCR – polymerase chain reaction

PPD – points of permanent deployment

MSEG – mobile sanitary-epidemiological group

MSEL – mobile sanitary-epidemiological laboratory

SED – sanitary-epidemiological detachment

SEL – sanitary-epidemiological laboratory

SEI – sanitary and epidemiological intelligence

SES – sanitary-epidemiological station

SIBA – specific indication of biological agents

MMB – military medical bag

THB – territorial hospital base

Part 1 Features of anti-epidemic measures in cases of emergencies in peacetime under conditions of quarantine infections

The organization and implementation of sanitary and hygienic, anti-epidemic measures together with medical and evacuation in the general system of medical and sanitary consequences liquidation of emergencies is important for the preservation of life, health and efficiency of the affected population.

1.1 Tasks, principles and basic measures of sanitary and anti-epidemic emergency support. Emergency criteria

Accidents, catastrophes and natural disasters in the area of emergency significantly complicate sanitary and epidemiological situation. This is due to the following reasons:

• destruction of residential and public buildings;

• destruction of water supply, sewerage and clear facilities, utilities and industrial enterprises;

• intensive population migration;

• changing susceptibility of the population to infections;

• destruction of sanitary-epidemiological, treatment-and-prophylactic institutions in the catastrophe zone;

• presence a large number of humans and animals corpses;

• mass reproduction of rodents, development of epizootics among them, activation natural foci of zoonotic infections.

All this contributes to deterioration of the sanitary and hygienic situation and exacerbation of many infectious diseases epidemic. In this regard, sanitary and anti-epidemic measures are part of the national system of disaster medicine, an important part of medical care and emergency response.

Sanitary and anti-epidemic support in emergencies includes a set of organizational, legal, medical, hygienic and anti-epidemic measures aimed at

preventing the emergence and elimination of infectious diseases, maintaining public health and maintaining its efficiency.

In the process of consequences liquidation of the emergency, sanitary and epidemiological support population is carried out in three directions:

• sanitary and hygienic measures;

• anti-epidemic measures;

• environmental control.

To determine specific sanitary and anti-epidemic measures must take into account the characteristics of different types of catastrophes, natural disasters and impact of factors and consequences of emergencies range on the nature of sanitary-epidemic situation, dynamics epidemic process in a particular nosological form of infectious disease.

Sanitary and anti-epidemic measures are aimed at solving the following goals:

- preservation and strengthening of public health, disease prevention;

- prevention of infectious diseases among the population;

- rapid elimination of infectious diseases when they appear.

Sanitary and anti-epidemic provision in emergency case is an integral part of medical and sanitary provision of the population, which includes a set of organizational, legal, medical, hygienic and anti-epidemic measures aimed at solving the following tasks:

1. Prevention of the occurrence and spread of infectious diseases among the population during emergencies, and when they occur, their elimination.

2. Preservation and strengthening of population health, maintenance of its working capacity by maintenance of sanitary well-being and elimination of adverse consequences of emergency situations.

3. Control over observance of sanitary rules and norms in the emergency zone and in the places resettlement of the affected population, elimination of infectious diseases in case of their occurrence.

Sanitary and anti-epidemic provision is based on the following principles:

1. State and priority nature of the sanitary-epidemiological service;

2. Unified approach to the organization of sanitary and anti-epidemic measures;

3. Conformity of the maintenance and volume of actions to a sanitary - epidemic situation;

4. Differentiated approach to the formation of forces and means of service, taking into account regional characteristics, the level of territories potential danger;

5. Constant readiness of its forces and means, their high mobility;

6. Interaction of the sanitary-epidemiological service with bodies and institutions of other departmental medical-sanitary services.

In order to prevent and eliminate health consequences of emergencies, the following main measures are taken:

1. Control over sanitary-epidemiological situation in the emergency zone and around it;

2. Examination of food raw materials, food, drinking water for contamination with radioactive substances, poison and chemically dangerous substances, pathogenic microorganisms;

3. Conducting special training of sanitary and epidemiological institutions employees and formations to work in emergencies;

4. Maintenance in readiness of sanitary supervision territorial centers, formations and establishments of sanitary subservice;

5. Accumulation, storage, replenishment, accounting and control of medical property, which is necessary for the work of formations and institutions of the sanitary-epidemiological service at the emergency;

6. Control over observance of sanitary rules, hygienic standards in case of emergency;

7. Organizes work of observation and laboratory control network for timely detection and indication of biological (bacteriological) contamination of drinking water, food and feed raw materials, food, environmental facilities during emergencies;

Due to the deterioration of sanitary and epidemiological situation in emergencies areas there are outbreaks. An outbreak is the location of people with an infectious disease, or territory, within which infected humans or farm animals with infectious diseases.

Characteristic features of the epidemic center in the areas of emergency are:

- mass infection of people and formation of multiple foci;

- long-term preservation of the hearth due to unidentified sources;

- reduction of incubation period due to constant contact with undetected sources of infections;

-presence of a large infectious dose of pathogens;

-lack of population and victims protection from contact with infectious patients due to late diagnosis and isolation of infectious patients.

Epidemiological Emergency Situation (EES) evaluated by the following criteria:

1. The risk introduction and spread of infectious diseases among the population;

2. Progressive growth of infectious morbidity among population in the center;

3. The threat of a significant number of infectious patients with various etiologies due to the "mixing factor";

4. Possible social and economic damage;

5. The appearance severe forms of infectious diseases that prevent timely evacuation patients from emergency zone to medical institutions;

6. The possibility of territorial bodies to fully resolve epidemiological situation;

7. The danger of infection outside emergency zone transmission.

Specialists of the sanitary-epidemiological service, after arriving in the emergency zone, conduct a thorough epidemiological investigation, assess epidemic condition of the territory, formulate a hypothesis about nature of

pathogen, ways of its transmission and possibility of further epidemic development.

The sanitary-epidemic condition of the emergency area can be assessed as prosperous, unstable, unfavorable and extraordinary.

Well-being is characterized by:

- presence of single infectious diseases that are not related to each other;
- satisfactory sanitary condition of the territory, water supply facilities;
- communal facilities.

Unstable state is characterized by:

- increase in the incidence of infectious diseases or emergence of group diseases without a tendency to further spread;
- presence epizootic foci of zoonotic infections threat to people;
- appearance of single infectious diseases that are related to each other with a satisfactory sanitary condition of the territory.

The unfavorable condition is characterized by:

- appearance group cases of dangerous infectious diseases in the emergency zone in the presence of conditions for their further spread;
- numerous diseases of unknown etiology;
- emergence of single diseases EDI;

The state of emergency is characterized by:

- sharp increase in the short term number of dangerous infectious diseases among the affected population;
- presence of recurrent or group diseases of EDI;
- activation natural foci of dangerous infections with appearance of diseases among people in the emergency zone.

1.2 Organization of anti-epidemic measures in emergency situations

Anti-epidemic measures should be aimed at neutralizing the sources of infection, disrupting the ways and mechanisms of pathogens transmission, increasing the population's immunity to infectious diseases, reducing the impact on

people of various extreme factors. Depending on climatic and geographical conditions, season, type of accident, catastrophe or natural disaster among the population there is a possibility of spreading viral hepatitis, typhoid fever, dysentery and other acute intestinal infections, as well as natural diseases (plague, anthrax, tularemia, leptospirosis, etc).

Anti-epidemic measures are a set of measures to prevent the emergence and spread of infectious diseases and their rapid elimination in the event of their occurrence.

Anti-epidemic measures are divided into two groups:

- measures to prevent the occurrence and spread of infectious diseases;

- measures aimed at eliminating epidemic outbreaks among population in the emergency area.

The main anti-epidemic measures include:

- sanitary and epidemiological investigation alleged areas of dispersal and placement of evacuees in the suburban area;

- epidemiological surveillance, which includes the study of settlements sanitary-epidemiological condition;

- timely detection of infectious patients, their isolation and hospitalization;

- accounting and remediation of pathogens carriers and persons suffering from chronic forms of infectious diseases;

- prevention of infectious diseases through the use of vaccines, serums, antibiotics and various chemicals;

- control of vectors transmissible diseases and rodents.

Elimination of health consequences in emergencies is complicated by the emergence of epidemic outbreaks of infectious diseases among the population. They are characterized by the following features:

- presence of infectious patients among victims and possibility accelerated spread of infection;

- activation mechanisms transmission of infectious agents in emergency zones;

- long-term action of undetected sources, appearance of long-acting foci;

- complexity of indication and diagnosis of infectious foci;

- presence minimum incubation period due to constant contact with undetected sources of infection, reduced resistance of the organism, a large pathogens infectious dose.

To assess degree epidemic danger of infectious diseases in emergency areas, a method is proposed that takes into account the main factors:

- pathogenicity of the infectious agent;

- mortality;

- contagiousness, expressed by the index of contagiousness;

- number of patients and number of estimated sanitary losses;

- number of contact persons and need for their isolation (observation);

- size of the epidemic zone.

The epidemic process in emergencies has features, but its inherent patterns of development may be violated. First of all, it concerns source of the pathogen, its type and place of natural life (habitat, reproduction and accumulation). In disaster areas, source of infection is difficult to establish, because forms of preservation of the pathogen, area of its habitat is changing. For this reason, several epidemic outbreaks of different nosological forms can occur simultaneously in the disaster zone.

The main anti-epidemic measures in the event of an outbreak:

- registration and notifications;

- epidemiological examination and sanitary-epidemiological investigation;

- detection, isolation and hospitalization of patients;

- regime-restrictive measures;

- general and special emergency prevention;

- disinfection of the epidemic center (disinfection, disinsection, deratization);

- detection of bacteriocarriers and enhanced medical surveillance of the affected population;

- sanitary-explanatory work.

Registration and notification.

All identified patients and suspects infectious diseases of persons are taken into special account. The chief physician of state sanitary center and epidemiological supervision of the district (city) must be immediately notified the detection of infectious patients. Upon receipt of data on the occurrence of highly contagious infections, disaster area and adjacent areas population is also notified with an explanation of conduct rules.

1.3. Epidemics of infectious diseases.

Measures to localize foci of mass infectious diseases

An epidemic is a mass disease of people with infectious diseases within a certain region, when level of infectious disease in this area significantly exceeds usually previously registered level of incidence for this area.

Outbreaks appear to be linked to:

-Natural factors;

-Climatic factors;

- Material and household factors;

- Social conditions.

The emergence of infectious diseases epidemics in emergencies contributes to:

1. Sharp deterioration of social and population living conditions (congestion, loss of housing, lack of electricity, drinking water, destruction of sewers, disruption of bath and laundry facilities, deterioration food organization).

2. Intensive migration of people.

3. The appearance large number of people with radiation sickness, mechanical injuries, burns, stress, which significantly reduce the body's resistance and increase susceptibility to infections.

4. No isolation sources of infection.

5. Possible mass reproduction of rodents, emergence of epizootics among them, as well as activation of natural foci of EDI (tularemia, plague, anthrax, etc.).

6. Application by enemy BW.

7. Deterioration of sanitary and hygienic condition territory due to destruction of industrial enterprises, presence of human and animal corpses, rotting products of animal and plant origin.

8. Failure or disruption of sanitary-epidemiological and medical facilities network due to emergencies or hostilities.

1.4. The main anti-epidemic measures in the epidemic outbreak liquidation:

1. Registration and notification;

2. Epidemiological examination and sanitary-epidemiological investigation;

3. Detection, isolation and hospitalization of patients;

4. Carrying out regime - restrictive measures (quarantine, observation);

5. Emergency non-specific and specific prevention;

6. Disinfection of epidemic center (disinfection, disinsection, deratization);

7. Detection bacteriocarriers and enhanced medical surveillance of the affected population;

8. Sanitary-explanatory work.

At detection of patients with EDI, group diseases by infectious diseases, or if fact of application by the opponent of BW is established, is carried out:

• public notification;

• sanitary-epidemiological reconnaissance or epidemiological surveillance of the infected area with sampling from environment, catching suspicious insects, rodents and so on.

• active identification of patients, their isolation and hospitalization is organized.

Timely and early isolation of patients with final disinfection is a cardinal measure that prevents the spread of infection.

Depending on the infection characteristics and the epidemiological situation, quarantine or observation is organized.

Quarantine is a set of strict regime - restrictive, isolation and anti - epidemic measures aimed at preventing the removal of pathogen both outside epidemic outbreak and its spread within the outbreak.

The organization of quarantine includes:

1. Complete isolation epidemic center with establishment of armed guards (encirclement) in the surrounding areas. Blocking posts are organized on all roads leading to the epidemic zone.

2. Strict control over the entry and exit of the population, removal of property from the quarantine zone. It is forbidden to pass through the center of contamination of vehicles and stops outside designated places when passing transit rail and water transport;

3. The organization of checkpoints on the main routes on which transportation additional forces and means for liquidation of the center is carried out. For material and technical supply, reception and transfer points are organized, through which raw materials, food, property, and machinery are delivered to the quarantine zone, and finished products are exported through them.

4. Creation of observers for persons leaving the quarantine zone;

5. Early detection of infectious patients, their isolation and hospitalization in a specially designated hospitals;

6. Restriction communication between certain groups of the population, termination of entertainment establishments activity, educational institutions, bazaars;

7. Protection infectious diseases hospitals, water sources, food warehouses, organization of the curfew service.

8. Establishment anti-epidemic mode of work in the medical establishments which are in the center;

9. Carrying out emergency and specific prevention and other measures.

The introduction of quarantine is accompanied by the introduction of observation in all adjacent administrative quarantine zone areas.

The observation assumes:

1. Restrictions on departure, entry and transit of all modes of transport through the territory. For this purpose adjusting posts are exposed;

2. Carrying out emergency prophylaxis among contact persons (carrying out vaccination);

3. Strengthening of medical control over the territory condition, organization of food, water supply, trade rules.

4. Survey and thermometry of population for the purpose of active and timely detection infectious patients and their hospitalization;

5. Strengthening of sanitary-educational work;

6. Restrictions on the movement and relocation of the population;

7. Disinfection of environment infected objects.

Observation and quarantine are canceled after expiration maximum incubation period of infectious disease from the moment of last patient isolation, carrying out final disinfection and sanitation of service personnel and population.

At all stages of medical care should be: provided the necessary anti-epidemic regime, disinfection of epidemic outbreaks (disinfection, disinsection, deratization); carrying out to the population of emergency nonspecific and specific prevention which duration of a course is defined by time which is necessary for activator detection and identification; detection and remediation of bacteriocarriers, enhanced medical surveillance of the affected population, personnel rescue teams. Sanitary and educational work is being strengthened, using radio, television and press. This work is aimed at strict compliance with the general recommendations of conduct rules, compliance with sanitary and hygienic rules and other personal protective measures.

1.5. Measures taken to identify a patient with especially dangerous infections and persons in contact with him.

In case of detection of a patient with EDI (or suspected of this disease) in all medical institutions, regardless of departmental affiliation, plans for stages of

medical evacuation are developed in advance with re-profiling of functional units, strict implementation of sanitary and anti-epidemic regime, job descriptions for the duty personnel on actions in this situation are developed.

When identifying among the affected patients with a particularly dangerous infection and contact persons, the doctor on duty must:

1 Immediately report the situation to the head of the medical evacuation stage (the hospital's chief physician).

2. Notify the personnel of the medical evacuation stage.

3. To give the order on transfer of reception and diagnostic department to a strict anti-epidemic mode of work.

The order of isolation and measures for the patient with EDI and persons in contact with him

After detection of the patient reception of patients in reception and diagnostic department stops. The patient with EDI is isolated at the place of detection. In the room where the patient was, doors and windows are closed, ventilation is turned off, ventilation holes are sealed with adhesive tape (except in cases of cholera). Entry and exit are prohibited, the front door is locked. The movement of patients stops. Patients at the reception, as well as persons accompanying the patient, are isolated in one of the vacant rooms (tents), they make lists indicating the time, degree and circumstances of contact.

A patient with a suspected dangerous infection with airborne transmission (eg, pulmonary plague) is fitted with a respirator to stop the spread of infection. Before receiving protective clothing, medical personnel protect the respiratory tract with a mask or towel.

The medical staff is instructed and redistributed in accordance with the scope and nature of the activities carried out in the source of infection. The medical staff working directly with the patient wears a protective suit of the appropriate type.

Before putting on the suit, exposed areas of the body are treated with 0.5-1% chloramine solution or 70% ethyl alcohol, mucous membranes - with a solution of the appropriate antibiotic or a weak solution of potassium permanganate.

The patient is given emergency medical care, material is taken for laboratory tests and analysis to establish or confirm the diagnosis, sanitary treatment is performed, the patient is changed the clothes. All clothes are prepared for sending to the disinfection chamber. Current disinfection is carried out (disinfection of secretions, vomit, sputum of the patient, care items). Data of epidemiological anamnesis are collected and recorded, with indication of surname, name, date of disease, complaints, probable source of infection, locations of the patient, possible contacts of the patient.

After registration of documentation, begin specific (if the diagnosis is precisely established) or nonspecific treatment (according to the scheme of emergency nonspecific prevention):

doxycycline orally 0.2 x 2 times a day or

rifampicin orally 0.6 x 2 times a day or

tetracycline orally 0.5 x 3 per day.

1.6. Anti-epidemic measures taken after elimination of the focus of EDI:

1. Final disinfection is carried out in places of permanent or temporary stay of the patient.

2. In the part, the settlement the epidemiological inspection of cases of disease on EDI for the purpose of revealing of a probable source of an infection and ways of its distribution is carried out.

3. Persons in contact with patients with EDI are actively identified and isolated in the observation department. They are subject to medical supervision, including questioning, examination, measurement of body temperature three times a day, laboratory examination and preventive treatment. The isolation period of these individuals is determined by the duration of the incubation period since the detection of the last patient and is: with plague 7 days, smallpox 6 days,

rickettsiosis 10 days and so on. Active detection of patients in settlements and medical supervision of them is carried out by the method of yard patrols by the staff of nursing teams, sanitary wives and so on, on a precinct-outpatient basis.

4. Emergency specific (vaccination) prophylaxis (according to indications) is carried out for the population.

5. According to the indications of the population, full sanitation is carried out.

6. Final (after detection and isolation of the patient) and preventive disinfection in the settlement, deratization measures are carried out.

7. Sanitary and hygienic and anti-epidemic measures are taken to organize food, water supply, accommodation, bath and laundry services, labor and life of the population.

9. Active sanitary and educational work with the population is carried out, which is aimed at acquainting the population with measures for the prevention of infectious diseases.

Removal of quarantine or observation from settlements with civilians is determined by the specific situation and is carried out at the request of the anti-epidemic commission - the head of the local administration.

1.7. Control questions

1. Indicate the prerequisites for the epidemic process.
2. Indicate what factors contribute to the activation of transmission mechanisms in emergencies.
3. Indicate the measures taken to prevent the occurrence of EDI by the medical service.
4. Indicate what must be done by the doctor on duty when he detect EDI.
5. What measures are needed in relation to persons who have been in contact with the patient?
6. Specify the drugs used in emergency nonspecific prophylaxis:
7. Indicate the anti-epidemic measures taken to eliminate the focus of EDI.
8. What are anti-epidemic measures? Basic principles of their holding?
9. The main purpose of sanitary and hygienic measures during natural disasters.
10. What are the main areas of work of medical workers in extreme conditions?

Part 2 Features of protection of troops and the population from biological weapons in emergencies, including during the war

2.1. Biological weapons. Definition, history, relevance

In modern conditions, the possibility of the enemy using **biological (bacteriological) weapons**, the action of which is based on the use of pathogenic microbes and their toxins, is not excluded. In a broader sense, biological weapons also include infected vectors and sources of infectious diseases (eg, arthropods and rodents) and pests of agricultural plants, which can cause great economic damage to the national economy. Specially trained animals (such as dolphins) are sometimes called biological weapons and are used to deliver explosives to targets. Biological weapons are also considered to be a group of growth substances (herbicides, defoliants) capable of destroying crops (especially fodder or industrial crops). This weapon consists of actual biological means and various devices for their transfer to the enemy zone. Thus, the concept of "biological weapons" is much broader than "bacteriological" weapons, and therefore more fully reflects the composition of specific means of destruction.

Missiles, bombs, shells, mines equipped with biological recipes can be used as technical means of delivery of biological ammunition. In addition, the technical means include a variety of mechanical generators and sprayers, which are installed on aircraft, ships, tracked or wheeled machines for dispersing biological material. Biological munitions also include containers with infected vectors (fleas, mites, mosquitoes, etc.), which are delivered by balloons or dropped by parachute.

Deliberate use of such biological agents to kill or destroy humans, as well as farm animals and plants, is part of the concept of "biological warfare."

As early as 1925, a group of countries adopted the Geneva Protocol "On the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Similar Gases and Bacterial Agents." 47 years later (1972) the Convention on the Prohibition of the Use of Biological Weapons was signed. This agreement has been ratified by

most countries. However, this convention does not prohibit the development of methods of protection against highly contagious factors.

Due to the high impressive capabilities of biological weapons, comparable to nuclear weapons, their much lower cost and more affordable production technology, biological agents are perceived by terrorists as the "atomic bomb of the poor."

There is reason to believe that terrorist epidemics may play an important role among the epidemics of this century. Obviously, they will not be directed against military targets, usually the best protected from such an attack, but mainly against the civilian population.

The most virulent microorganisms and strong toxins will be chosen by terrorists as biological agents. Thus, according to US experts, in the arsenal of Iraq - a "rogue country" that is ready to use biological weapons - there are 10 thousand liters of concentrated botulinum toxin and another 605 thousand liters of anthrax spores.

In this regard, military doctors must know not only the patterns of the natural epidemic process, but also the features of the deliberately caused epidemic process, which is biological warfare.

The special staff of the military medical service must know the basic types of biological weapons and their features, as well as be able to organize the protection of troops and the population in the aftermath of the biological attack of the enemy.

Types, properties, striking effect

Actually, biological weapons are divided into the following main types: 1) bacteria, 2) chlamydia, 3) rickettsiae, 4) viruses, 5) fungi, 6) protozoa and 7) biological poisons (toxins). Bacteria, viruses, rickettsiae and toxins can be of the greatest practical importance, although the use of fungi and protozoa by the enemy is possible.

It is also worth considering the possibility of using the phenomenon of microbial variability to obtain highly virulent strains, which can significantly

complicate the recognition of altered pathogens and preventive measures. The enemy may use combined formulations containing pathogens of several diseases, as well as biological weapons in combination or simultaneously with toxic or radioactive substances.

Some pathogens can cause the enemy only a temporary loss of ability to work and combat readiness, and therefore - to promote the capture of manpower. Others can lead to the simultaneous mass death of humans and animals, followed by self-localization of the source of infection or, conversely, due to significant resistance in the environment to create a long-term risk of infection. Pathogens such as yellow fever viruses and psittacosis can be used in close combat. For offensive actions will obviously be selected people with naturally or artificially immunity against these diseases. In the siege of cities or fortifications, the most suitable are fast-acting and unstable bacterial agents (botulism toxin) or those that temporarily disable (brucellosis, tularemia). To strike industrial areas in the rear, the enemy can use pathogens with high retroactivity, as well as botulinum toxin. Pathogens with an air-drop transmission mechanism are optimal for defeating army garrisons. In defense, it is possible to use the tactics of "scorched earth". In this case, the enemy can use resistant pathogens (brucellosis, tularemia) and highly resistant (anthrax, Ku fever). Pathogens such as glanders, foot-and-mouth disease, brucellosis and anthrax are suitable for infecting farm animals. Valuable plants can be affected by pathogenic fungi. Thus, biological weapons allow high maneuverability.

Modern advances in molecular biology and genetic engineering make it possible to obtain over virulent and particularly resistant strains of microorganisms. According to the press, Russia has announced the creation of a new generation of incurable pathogens. These microorganisms are completely resistant to antibiotics and are able to resist vaccines. In particular, plague and anthrax bacteria have already been genetically modified.

Biological agents that can be used as weapons must meet the following requirements:

-perceptibility of people to pathogens should be high (for example, to plague - 100%, to typhoid fever - about 50%);

-have high virulence;

-have combat effectiveness, ie cause illness with the desired effect;

-provide the possibility of production in the laboratory in large quantities at minimal cost;

-ability of microbes to exist outside the body of the host (animal or human);

-possibility of creation of the combined microbic compoundings for the purpose of a heavy course of a disease, complication of prevention, difficulties of their laboratory and clinical diagnostics;

- possible use of the formulation in the form of aerosols;

-must have effective means of protecting their troops from the pathogens of these diseases or their toxins.

The combat properties of biological weapons are determined by the following factors:

- the ability to suddenly cause mass infectious diseases of humans and animals when infected with microdoses (for example, 1 g of dry botulinum toxin contains 8 million lethal doses for humans; for infect humans with a smallpox enough few vibrios);

-ability to spread quickly among people and animals (latent infection of visitors at the station, subway, airport, stadium, concert hall will lead to the sudden onset of a colossal epidemic process);

-complexity and duration of indication in the environment and difficulties in determining the type of pathogen or toxin used by the enemy;

-difficulty in diagnosing a disease caused by biological weapons, especially when the enemy uses combined formulations;

- the presence of a latent period of action, ie the time that elapses from the moment of penetration of the biological factor into the human body to the appearance of the striking effect;

-the ability of microbial and toxin aerosols to penetrate together with the air into various leaky shelters, buildings, combat vehicles, hit people in them and contaminate objects;

-ability to be stored and transported in small containers that cannot be detected by modern reconnaissance means;

-duration of action, ie the ability of a number of pathogenic microbes to persist for a long time in the environment or in infected insects or rodents.

Thus, not only primary sanitary losses (affected by direct exposure to biological weapons) are possible, but also secondary ones related to the aspiration of secondary aerosols, the use of contaminated water and food, and the infection of people from already infected people or animals.

Biological weapons have the following features of striking action:

- large area of action and efficiency;

-there are significant difficulties in establishing the fact of the use of biological weapons by the enemy, because there is no explosion and light radiation, microbes are invisible, the devices with which the army is equipped, can not immediately detect them;

-secret application provides a great striking effect;

-different incubation period of bacterial formulations used, allows to plan the attack so that the striking effect occurred at the right time for the attacking party;

- the possibility of creating stable lesions - when using spore forms (anthrax) or due to highly contagious infectious diseases;

-opportunity to cause not only the disease, but also psychological stress in the enemy - to instill fear, panic among the troops and the population;

-selective action, which consists in the fact that only living organisms are affected without the destruction of material values in epidemic foci.

Many microbes are highly resistant not only under natural conditions, but also at high temperatures, which occur at the time of the explosion of artillery shells and mines.

The striking effect of biological weapons is mainly due to the type of pathogen or toxin used, because depend on their properties: selectivity of the lesion, speed of action (duration of incubation), severity of the lesion, contagiousness and stability in the environment.

Characteristics of the main biological means of attack

Evaluation criterion	Group of biological agents	Types of biological agents and diseases
1	2	3
selectivity of defeat	To defeat a person	**Bacteria:** plague, anthrax, tularemia, glanders, melioidosis, brucellosis, legionellosis, typhoid fever, cholera. **Chlamydia:** psittacosis (ornithosis), trachoma. **Rickettsia:** epidemic typhus, Rocky Mountain spotted fever, Ku fever, Tsutsugamushi fever. **Viruses:** smallpox, hemorrhagic fever Lassa, Marburg, Ebola, hemorrhagic fever with renal syndrome, Bolivian hemorrhagic fever, Venezuelan equine encephalomyelitis, eastern equine encephalomyelitis, yellow fever, Japanese fever, fever. **Fungi:** coccidiosis, nocardiosis, blastomycosis, histoplasmosis. **Toxins:** botulinum, clostridia, anthrax, staphylococcal B, etc.

2.2.Factors influencing the striking effect of biological weapons. Means of delivery of biological agents

The following main methods of using biological weapons are known: 1) creation of a biological aerosol for pollution of the surface layer of the atmosphere; 2) use of infected vectors; 3) direct contamination with food or water pathogens by sabotage.

In the combat use of biological weapons, the defeat of the enemy will be achieved mainly by air pollution. To do this, create an aerosol which consists of small drops of liquid or solid particles of the formulation suspended in the air. It can be obtained during an explosion of ammunition or when spraying the formulation from special aircraft or ground devices.

Following the movement of the aerosol cloud, there are changes in the concentration of biological weapons, ie changes in the level of biological dose. Under the biological dose means the number of biological weapons that entered the human body through the respiratory system during the entire stay in the aerosol cloud.

Ammunition and sources of biological aerosol allow to create in the area of its generation biological dose levels that reach several thousand OD50 and more. As the aerosol clouds move in the wind direction, the biological dose levels gradually decrease, reaching values of 1 OD50 or less.

The degree of contamination of the area, military equipment, uniforms and other objects in this area is different. Thus, in the immediate vicinity of the aerosol source due to the subsidence of the coarse phase is a massive infection, and as the cloud moves away from the place of its formation, the intensity of infection decreases rapidly and is determined by the adhesive properties of surfaces (wet, oily, rough, etc.).

Infection of humans is most likely during the passage of the primary cloud. The duration of the biological aerosol cloud over objects varies from a few minutes to several hours and depends on the power of the source, the distance traveled by the cloud from the place of its generation, wind speed and some other factors.

Due to the formation of dust due by the wind or movement on the bacterially contaminated area may be re-lifting into the air of the initially settled particles and the formation of a secondary aerosol. The danger of the area of biological (bacterial) contamination will depend on the stability of the applied agent, meteorological conditions and the nature of the terrain (relief, soil, vegetation).

Depending on the method of use of biological weapons, *the center of biological pollution means:*

-in the formation of an aerosol - the surface layer of the atmosphere containing its aerosol in striking concentrations, and the area with troops, population, military equipment and other objects, as well as elements of the natural environment over which the cloud passed;

- when using infected vectors - the area of their distribution;

-with subversive use - the object of sabotage.

Personnel at the center of biological pollution are considered potentially infected.

Advantages of aerosol application of bacterial means:

1. The possibility of using pathogens of various diseases, which in natural conditions are spread not only by air-drop, but also by food, contact and household and through the bites of blood-sucking insects. For example, under normal conditions, typhoid fever is transmitted from a patient to a healthy person only through lice, and typhoid fever - only if the pathogens enter the digestive tract with water and food. As part of aerosol bacterial formulations, these pathogens infect humans through the respiratory tract.

2. Ability to pollute a larger area, as well as leaky defenses.

3. The ability to create a significant focus of mass losses.

The depth of penetration of the bacterial cloud by the wind with the preservation of the impact depends on the biological properties of the pathogens used, their concentration in the air, as well as meteorological conditions and the nature of the area.

One of such factors is the vertical stability of the surface layer of air. There are three degrees of vertical stability of air: inversion (absence of ascending air flows), isotherm (weak ascending air flows), convection (significant ascending air flows). Therefore, under conditions of convection, the aerosol cloud of bacterial agents will dissipate quickly, which will reduce the striking effect. The most favorable conditions for the use of biological weapons - inversion and isotherm, which occurs at night, at dawn, on a cloudy day.

Wind power has a significant effect on the concentration of biological aerosol. The larger it is, the faster the aerosol cloud dissipates and, consequently, the striking effect decreases. Rain and snow accelerate the deposition of the aerosol. Their impact is greater the larger the aerosol content.

Solar radiation (ultraviolet rays) has a detrimental effect on microorganisms, especially vegetative forms. High temperature, low and high humidity have a similar effect.

In addition to meteorological factors, the striking effect of biological weapons is influenced by the residence time of the aerosol in the environment. Many microbes lose their virulence after 1-2 hours, although they still remain viable.

The decisive factor in aerosol contamination is the dose of infection, ie the amount of pathogen or toxin with aerosol particles that have entered the human body and can cause disease. This dose is directly related to the concentration of the aerosol in the air, the time of exposure, the volume of pulmonary ventilation and the delay of the aerosol in the lungs. Therefore, the higher concentration of biologically active aerosol in the air, the longer exposure, the greater volume of pulmonary ventilation and the greater retention of aerosol particles in the lungs contributes to increasing the dose of infection.

Means of delivery of biological agents.

Delivery of biological munitions to the target can be carried out using missiles of various classes, aircraft and automatic balloons.

Therefore, the following are used: aircraft bombs of various calibers and designs; aviation cartridges with small bombs that can be stabilized and scattered (scattered) independently. One bomber aircraft with a full load of self-propelled cassettes and bombs can cover an area and hit people in the tens or even hundreds of square kilometers. In addition, aircraft are effective, as well as automatic balloons equipped with spray devices; special aviation containers with infected insects and mites; guided and unguided rockets of different classes with a warhead equipped with stabilized small bombs or those that disperse independently; ground (portable) scattering devices to influence the enemy, who is hiding in defensive structures.

Another possible means of using biological weapons is transmissible, associated with the deliberate dispersal of artificially infected blood-sucking arthropods (insects, mites) in the target area. The basis of this method is that many arthropods easily perceive and long stored pathogens of dangerous infectious diseases.

The subversive method involves the deliberate covert use of biological weapons by polluting the air, water, food, and fodder.

Using small-sized sabotage equipment (portable aerosol generators, spray cans), at some point you can bring biological weapons into the air in crowded places, water in the urban water supply system, which can lead to sudden outbreaks of severe infectious diseases among the population, cause general panic and undermine morale. For example, to effectively contaminate 20 million liters of drinking water (so that every 20 ml contains 1 mcg - one lethal dose of botulinum toxin for humans), it is sufficient to use only 240 g of botulinum toxin type A.

The enemy may use biological weapons in sabotage in advance, before the official notification of hostilities, in order to disrupt the work of important industries and agriculture. In biological warfare there may also be cases of deliberate infection of prisoners of war, civilians, animals, plants, food supplies, fodder by the enemy in order to spread mass epidemics and epizootics in the army and in the rear.

2.3 Features of the artificially induced epidemic process in as a result of the use of biological weapons by the enemy

The artificial spread of an infectious disease differs from the natural epidemic process by a number of features. Their detection is important for the indication of biological agents, because it is far from always possible to establish the fact of the use of such weapons on the basis of external signs.

Signs of an artificial epidemic process:

-absence of a natural source of the pathogen, ie infections occur without the presence of sick people, animals or carriers;

-imultaneous, mass, predominance of severe forms of the disease, the possibility of mixed forms of infection due to the simultaneous use of different pathogens and toxins;

-ways of transmission of infectious diseases may be unusual (for example, aerosol route in typhoid or typhoid fever);

-possibility of overcoming the existing immunity due to the high virulence of pathogens and a massive infectious dose;

-mass infectious diseases will occur in areas that were previously prosperous in terms of sanitation and epidemiology, in an unusual climatic zone and season.

In an artificial epidemic process, the use of massive doses of high virulence infection, the use of bacterial aerosols and rains, the combination of biological weapons with other species, etc. can significantly complicate and even modify the course of epidemics and individual outbreaks. In the context of biological warfare, the main, obviously, will be the air-drop mechanism of spread of pathogens and their toxins as potentially dangerous and effective (in anthrax, plague, botulism). Accordingly, anti-epidemic measures should be built in the troops, aimed at protection against biological weapons in anticipation of an attack by the enemy.

Features of biological terrorist acts

-Compressed epidemic curve with a peak reached by some pathogens in a few days (epidemiology of "point source"). Because, a large number of victims fell under the influence of the pathogen at about the same time. And when terrorists

use biological toxins, the maximum number of victims will appear within a few hours.

- "Impossible epidemiology". For example, equine encephalitis is an endemic infection. Their widespread distribution will registered in the absence of conditions for natural transmission - vector mosquitoes and outside known endemic areas only in the case of a biological attack.

-Localization of the epidemic center. In the case of aerogenic infection of humans, the epidemic will arise on the leeward side of the attack site, ie in the area of the aerosol cloud. The same reason will cause a high frequency of lung lesions.

-High rates of morbidity and mortality among the exposed persons. They depend on the pathogen chosen by the terrorists and the conditions of the terrorist act. In addition, the clinical symptoms of the disease can be forgotten due to its long absence in the region.

-Lower morbidity rates in people who were partially protected from exposure (for example, were inside the house). If the attack is carried out in the house, the opposite pattern will be observed.

-Resistance of strains of microorganisms to drugs. This feature is related to one of the requirements for biological weapons.

Regularities of repeated use of a biological agent

- there will be no compressed epidemic curve;

- there will be several primary epidemic outbreaks;

- the phenomenon of "impossible epidemiology" will remain or several infectious diseases with "impossible epidemiology" will appear at the same time.

2.4. Protection of troops from biological weapons

Protection of troops from biological weapons is a set of organizational, anti-epidemic, sanitary-hygienic and medical-evacuation measures aimed at preventing the emergence and spread of infectious diseases in the conditions of use of biological weapons by the enemy.

The main tasks of protecting troops from biological weapons are: a) to prevent the sudden biological attack of the enemy; b) weaken the striking effect of biological weapons through a system of personnel self-defense measures; c) quickly and skillfully eliminate the consequences of a biological attack, if they failed to prevent.

The military medical service requires high efficiency, appropriate equipment and qualifications of medical personnel for implement the complex of protection of troops from biological weapons.

The basic principles of anti-epidemic protection of troops include:

1) conducting SERs and monitoring;

2) treatment of infectious patients without their evacuation to the rear of the country;

3) creation of specialized (anti-epidemic) medical service institutions;

4) creation of sanitary-epidemiological barriers between the front and the rear;

5) anti-epidemic support of military transportation, civilian population and non-military contingents;

6) constant communication with civilian health authorities;

7) carrying out in the troops and in the area of their location a complex of sanitary and hygienic means;

8) rational specific prevention of infectious diseases in the army;

9) sanitary and educational work among the personnel.

The command organizes the protection of troops from biological weapons by identifying the most important measures. Based on the decisions of the commanders, the headquarters, together with the commanders of the military branches, develop a plan for protection against biological weapons.

It is important to identify the perpetrators of anti-epidemic measures and the protection of troops from biological weapons, as well as the authorities. Functional areas of management are epidemiological and diagnostic (justification of measures and the entire management decision), organizational (registration of the decision

and bringing it to the executors), methodical (preparation of executors for proper implementation of measures) and control (checking the timeliness and quality of measures).

The executors of measures of anti-epidemic protection of troops and their protection from biological weapons are various institutions and divisions of medical and chemical services, logistics services and other special services of units, as well as all personnel of the troops. Sanitary and epidemiological institutions and subdivisions take part in carrying out separate actions (laboratory researches, disinfection). However, the specialists of these institutions and subdivisions belong to the category of specialists of the governing bodies.

The medical service participates only in special events. These include biological reconnaissance, the use of individual and collective means of protection, regime-restrictive measures, emergency and specific prevention, disinfection in the center, medical and evacuation measures.

All measures to protect against biological weapons are carried out in a certain sequence: a) pending its use by the enemy, b) at the time of use of biological weapons, c) during the elimination of the consequences of their use.

2.5. Measures to protect against biological weapons pending its application, or at the time of its application

The personnel of the medical service must pass special training on protection against biological weapons:

-study its features and methods of application;

-master methods of protection, methods of indication of bacterial agents and methods of sanitation;

- learn the provisions of a strict anti-epidemic regime;

-study the principles of organization of regime-restrictive measures and features of medical and evacuation support in the conditions of biological warfare.

At the time of use of biological weapons it is necessary to use individual means of protection: at the alarm signal the personnel immediately puts on gas

masks, all-military protective sets, protective gloves. In the absence of a gas mask, you can use respirators and hand-held respiratory protection equipment, such as a handkerchief, overcoat edge, cotton gauze bandage, etc. For protection of skin and uniform apply an individual antichemical package.

If possible, personnel can use collective means of protection - sealed storage facilities equipped with filter-ventilation units.

On ships, complete sealing of the outer contour of the ship with the inclusion of filter ventilation devices to prevent contamination of the outer surfaces of decks, superstructures, weapons and technical means, a water protection system is used, which provides the creation of a movable protective film of seawater on the surfaces. In the absence of special technical means of protection, the pressure and fire system of the ship is used.

2.6 Biological weapons protection measures aimed at elimination of consequences of its application

Primary sanitary losses in the center of biological damage will depend on the following factors:

- number of contact persons;
- contagious disease index;
- timeliness of sanitary and anti-epidemic measures;
- effectiveness of vaccination;
- effectiveness of non-specific prevention.

It is believed that under average conditions, sanitary losses can be 10 - 15% (city, region) and 4% in the whole state.

Secondary sanitary losses from contagious formulations are approximately twice the number of primary sanitary losses. On average, they will be an additional 20-30%, and the total loss from the use of contagious biological agents can reach 40-50% of the number infected with biological weapons.

The development of the epidemic process after the use of biological weapons by the enemy will not occur gradually, as is the case with the spread of influenza,

but in the form of an epidemic outbreak. Simultaneous mass infection of people will lead to the simultaneous emergence of mass diseases. The largest number of primary patients (up to 50%) will appear on the second day after the first cases of the disease.

In the first days after the outbreak, the structures of the State Disaster Medicine Service, the Ministries of Health, and the Interior may be "paralyzed" due to a number of objective and subjective circumstances:

- one-time occurrence of mass diseases;

-preparedness of the medical service to accept such a large number of patients;

- the need to introduce administrative order in the center of biological pollution

-mass diseases among employees of these authorities, etc.

These reasons, as well as the possible use in the country and other weapons of mass destruction, the declaration of war, etc. can lead to chaos.

In addition, during the elimination of the infectious center from secondary aerosols and contacts with patients will be additionally infected: with plague - 20-30%, with glanders, melioidosis - 10-15%, with anthrax - 3-5%, with American encephalomyelitis - 1 -2% of liquidators.

In order to eliminate the consequences of the use of biological weapons by the enemy, the following set of measures is taken.

1. *Conducting biological exploration.* A specific indication of bacterial agents is performed and the boundaries of the infectious center are determined.

An *infectious center* is an area with people, animals, military equipment, vehicles and other objects placed on it, which are directly affected by biological weapons.

The specific indication of bacterial agents is reduced to determining the type of bacterial agents used and is carried out by medical, chemical and veterinary services. The boundaries of the infectious center are determined on the basis of data on the depth and breadth of aerosol cloud penetration, the area of detection of indirect signs of biological weapons, as well as on the basis of survey of victims, laboratory tests of samples taken from environmental objects, information about diseases among troops and civilian population and laboratory examination data, detection of signs of artificially induced epidemic process and special calculation data.

2. *Disinfection in the infectious center*. Special treatment of troops, disinfection and disinsection of places and defensive structures, disinfection of water and food are carried out. Special treatment of troops includes sanitation of personnel and disinfection of weapons, military equipment and transport, uniforms, footwear, equipment and personal protective equipment. It is carried out in two stages: immediately after the use of biological weapons carry out partial special treatment, then - full special treatment of troops. Partial special treatment in units includes partial sanitation of personnel and partial disinfection of weapons and equipment, as well as full - personal weapons. Carried out in the order of self- and mutual assistance by order of unit commanders. It consists in the removal of pathogens from exposed skin, the surface of wearing personal protective equipment, uniforms, equipment and footwear, weapons, equipment, personal weapons.

Mechanical removal (rinsing with water) of microorganisms and disinfection with disinfectant from the individual anti-chemical package IAP-8 or IAP-9 is used. The next stage is a complete special treatment, which consists in a complete sanitation of personnel and disinfection of military equipment, weapons, transport, uniforms, shoes, equipment. Complete sanitation is based on washing personnel with warm soapy water, disinfecting uniforms and changing clothes. To carry out a complete special treatment by the chemical service, a special treatment point is deployed.

Disinfection of terrain and roads is performed by chemical troops. It is carried out, first of all, at the positions of missile troops, air defense forces, at control points and at medical points. Disinfection of the areas of the infected roads which do not have detours, entrances to crossings through water obstacles is carried out. Disinfection of buildings is usually performed by the personnel occupying them. The most important from disinfectants used in these conditions are degassing substances, which also have disinfectant properties: two-thirds of the basic salt of calcium hypochlorite, monochloramine B, 5% solution of hexachloromelamine in dichloroethane. In winter, to prevent freezing of degassing solutions, antifreeze (calcium, magnesium or sodium chloride) is added to them.

Peculiarities of disinfection on ships of the Navy are mainly due to their autonomy and high technical equipment, in particular the presence of special devices for

decontamination-degassing, also designed for disinfection (water protection system, degassing devices and kits, etc.).

Water disinfection is entrusted to the engineering service, food disinfection - to the food supply service. The medical service is responsible for: a) complete sanitation of the wounded and sick arriving in the medical department; b) partial sanitation of the wounded and sick in the WFP; c) disinfection of ambulances; d) disinfection measures at the stages of medical evacuation; e) quality control of disinfection measures on them; f) quality control of disinfection in the infectious center; f) advisory assistance and methodological guidance of all disinfection and disinsection issues.

3. *Emergency and specific prevention.* Immediately after establishing the fact that the enemy uses biological weapons, emergency prophylaxis with broad-spectrum drugs is carried out. After establishing the type of means used by the enemy, specific prophylaxis is carried out, for which gamma globulins are used, in many cases - vaccines, serums, antibacterial and antipyretic drugs for targeted preventive treatment. Emergency and specific prevention is carried out by medical workers of units and formations by order of commanders.

4. Regime-restrictive measures. Immediately after the fact of the enemy's use of biological weapons in the troops under its influence, an observation regime is introduced. After receiving the results of the indication of the used means, in case of detection of pathogens of especially dangerous infections, the observation is replaced by quarantine - a more severe set of regime-restrictive measures. If the pathogens used are not particularly dangerous infections, the troops continue to observe. The infectious center (site) is marked to restrict entry and exit, as well as transit travel. These measures are carried out by the medical service of units and formations with the participation of specialists and units of sanitary-epidemiological and medical institutions.

5. *Medical and evacuation support of parts.* Immediately after the establishment of the fact of the use of biological weapons by the enemy, the evacuation of the wounded and sick from the military stages of medical evacuation to medical institutions is temporarily suspended. At the same time, the amount of assistance in units i on the WFP is reduced as much as possible. However, the amount of medical care in OMedB may increase and

approach specialized. In the case of the establishment of pathogens of not particularly dangerous infections, used as biological weapons, evacuation to medical institutions is resumed.

When pathogens of especially dangerous infections are detected or when patients with these diseases appear, a quarantine is imposed on a part (joint), and an infectious hospital as a part of PSB is put forward to it for providing specialized care on the spot.

In the event of a biological weapon hitting the stage of medical evacuation, the whole set of measures to eliminate the consequences is carried out by the forces and means of the stage itself. This is the use of individual and collective protection measures for the wounded and sick, as well as staff, special treatment and disinfection (disinfection of premises and stage location), implementation of regime-restrictive measures, emergency and specific prevention of the wounded, sick and staff.

In the new conditions, along with the active immunization of personnel against infectious diseases, it is necessary to prophylactically use bacteriophages, antibiotics, notivipycni chemotherapeutics, therapeutic sera and other emergency prophylaxis. These important preventive measures should be taken without waiting for the results of the indication of the samples taken in the infectious center, without reminders and instructions of the senior medical chief.

The possibility of the use of biological weapons by the enemy will encourage the expansion of indications for routine vaccinations. There will be a need to immunize the military immediately to many particularly dangerous infections.

Systematic implementation of a set of sanitary-prophylactic and anti-epidemic measures in the troops and among the population allows to create such a sanitary-epidemiological situation, on the basis of which it is easier to carry out protection against biological weapons. The degree of defense capability largely depends on the level of sanitary culture and the sanitary-epidemiological condition of the army and the front rear area. The solution of these tasks is associated with the hard work of the entire military medical service in cooperation with civilian

health authorities, which should include not only obtaining the necessary information, but also mandatory assistance and participation of the military medical service in eliminating the consequences of a biological attack among the population.

An important preventive measure is the systematic training of civilians and military personnel in the basics of protection against biological weapons, training of freelance teams to work in possible infectious centers, training on mutual aid and self-help during the biological attack.

One of the means of protection against biological weapons are special medical units, as mobile as possible and equipped to work in infectious foci. These units must have modern laboratories, appropriate protective equipment (masks, suits), as well as drugs for mass specific prevention and disinfection in the cells.

In the event of a biological attack by the enemy, there must be: a warning system for troops and the population; a plan for the deployment of special and administrative measures has been drawn up, the implementation of which must be ensured by material means and personnel. Timely precautionary measures and developed protection will minimize the danger of the enemy using biological weapons.

If the enemy uses biological weapons, the health service will not be able to provide full and timely measures to localize and eliminate the epidemic. The effectiveness of anti-epidemic measures will depend on the active participation of all civil defense services under the leadership of its territorial headquarters. Each such service shall take measures within its competence. The communication service informs the population about the dangers of using biological weapons, instructs residents on the rules of use of means of protection and behavior in the center of infection. The public order protection service ensures compliance with the restrictive rules of quarantine, protection of medical institutions, participates in the creation of a checkpoint. The communal and technical service cleans the territory, disinfects water supply sources, carries out sanitary treatment of people and equipment. The motor transport service provides all units of civil defense with

transport equipment and disinfects it. The Service for the Protection of Animals and Plants participates in the biological investigation and specific indication of pathogenic agents, in the localization and elimination of the epidemic center (together with the health care service), provides treatment and prevention of animals. The trade and food service is responsible for the protection and disposal of food and its provision to the population. In difficult situations, the senior civil defense chief may send a first aid unit to the center to strengthen the local health service, and an anti-epidemic unit or an epidemiological intelligence group to assist the territorial sanitary epidemiological station.

2.7. Specific prevention of infectious diseases

Individual means of protection of the population from biological weapons, such as gas masks and protective clothing, include methods of specific prevention and therapy (use of vaccines, serums, antibiotics).

Immunoprophylaxis of infectious diseases is an important component, and sometimes the only effective way to prevent, reduce or eliminate them.

According to military experts, today the means of specific prevention are not developed for all pathogens (microorganisms) that can be used as biological weapons. Therefore, research institutions are working intensively to improve the quality of existing and create new highly effective drugs against all infections, the causative agents of which are potential agents of biological weapons.

Biological drugs used for specific purposes prevention (active immunization) and protection of the population from infectious diseases can be divided into three groups:

A - those that create artificial active immunity;

B - provide passive protection;

B - delay the development and reproduction of the pathogen.

Group A drugs that induce active immunity include:

-vaccines;

-anatoxins;

-protective antigens.

Vaccines are considered to be a powerful means of protection against biological weapons, which, if given in a timely manner, as well as for epidemiological indications, can significantly prevent or limit the spread and alleviate the incidence of infectious diseases resulting from biological attack. Therefore, the problem of vaccine prophylaxis is in the spotlight.

Vaccines contain antigens and create active artificial immunity. Antigens are obtained from microorganisms in different ways, respectively, there are several types of vaccines.

Live vaccines: microorganisms with or without reduced virulence (against smallpox, brucellosis, tularemia, anthrax, plague, typhus, yellow fever, influenza, etc.);

Inactivated vaccines: microorganisms inactivated by chemical (phenol, formalin, merthiolate, alcohol, etc.) or physical (high temperature, ultraviolet or gamma rays) means - against typhoid fever, influenza, tick-borne encephalitis;

Chemical vaccines: antigens of microorganisms, maximally purified from foreign substances by means of ultrasound, centrifugation, chromatography, gradient supercentrifugation (against typhoid fever, meningococcal disease);

Associated (combined) polyvaccines (AKDP - associated against pertussis, diphtheria and tetanus);

Prospects - new types of vaccines: synthetic, genetically engineered and anti-idiotypic. They have serious advantages, and therefore are likely to displace current vaccines in the future.

Anatoxins on technological grounds are analogues of the inactivated vaccine, where the role of immunizing antigen are exotoxins of toxin-forming bacteria. They are used repeatedly, administered parenterally, create a stable antitoxic immunity.

Biologicals that provide rapid but short-term protection (group B) include sera from hyperimmune animals or humans and globulins that contain protective antibodies.

Group B includes biological drugs that have a detoxifying effect on infectious agents. These include bacteriophages and interferon. Salmonella, cholera, staphylococcal and diphtheria bacteriophages are used for therapeutic and prophylactic purposes. Interferon is a group of low molecular weight proteins with antiviral activity. They inhibit the reproduction of many vypyci, create obstacles to their penetration into the host cell.

Immunoprophylaxis is considered to be the main means of specific protection against biological weapons of the personnel of the population. Vaccinations against infectious diseases are divided into routine and systematic vaccinations according to epidemic indications. The latter can be regular or episodic.

Regular vaccination against epidemic indications is carried out against plague, tularemia and tick-borne encephalitis in the natural foci of these infections. Episodic vaccination for epidemic indications is carried out during the period of threat of infection in the military unit or in case of illness. Thus, it is known that in the Iran - Iraq conflict (January 1991) American soldiers were vaccinated against anthrax, in order to prevent its spread among military personnel, in the case of the use of anthrax as a biological weapon. The United States is doing the same in connection with bioterrorism (Autumn 2001).

The program of medical protection and modernization strategy developed in the USA envisages vaccination with vaccines - products of genetic engineering and multiagent vaccines, therapy with poly- and monoclonal antibodies, amino acid therapy.

Regarding the pathogens of chlamydia (ornithosis), mycoses (blastomycosis, histoplasmosis, coccidioidosis) as potential agents of biological weapons, effective means of specific prevention have not yet been developed. Work is underway to create a chemical vaccine against spotted fever Rocky rip, tularemia vaccine and some others.

Among the causative agents of particularly dangerous infections, the number of viral agents is quite significant and is constantly growing due to the discovery of

new, previously unknown to science pathogenic for humans vypyciv. Against herpesviruses (monkey encephalitis), apenavipyciv (Bolivian fever, Lassa fever), togaviruses (Karelian fever, Pichki Ros), flavoviruses (East Nile fever), bunyaviruses (Californian encephalitis) and many others Its pathogenicity groups have not developed effective vaccines. Lassa and Ebola vaccines are under development. Dermal, tissue and ovarian vaccines are effective for the prevention of smallpox (the causative agent belongs to poxviruses). It is known that in 1980 the WHO announced the complete elimination of this disease worldwide, due to vaccination against smallpox were stopped. However, in the event of a danger of the spread of smallpox, WHO institutions are ready at any time to take all necessary measures to eliminate it. There are constant stocks of anti-measles vaccine for vaccination of 200 million people.

Existing schemes of active immunization against pathogens of a vypic nature are given in the table. Along with vaccination, an important measure of anti-epidemic protection of dangerous infectious diseases is emergency prophylaxis (preventive treatment) with antibiotics and other chemotherapeutics. Among such means of protection against biological weapons, broad-spectrum antibiotics are widely used.

Oral broad-spectrum antibiotics are effective in most diseases caused by bacteria and rickettsiae, as well as in some viral diseases. One ton of antibiotics is enough to treat 45,000 people at a time.

Table Schemes of active immunization of antiviral diseases

Group viruses	Disease	The name of the drug
Togaviruses	Venezuelan equine encephalomyelitis	Live killed divaccine from strain TC-83
Flaviviruses	Omsk hemorrhagic	Killed formol vaccine
	Yellow fever	Lyophilized live attenuated from strain 17-D or "Dakar"
	Japanese encephalitis	Inactivated vaccine

	Tick-borne encephalitis	Liquid or concentrated dry vaccine
Phlebovirus	Rift Valley Fever	Lyophilized culture vaccine
Neuroviruses	Crimean-Congo hemorrhagic fever	Formalin inactivated vaccine
Rhabdovirus	Rabies	Dry inactivated culture rabies vaccine RAB and VAK Vnukovo-32 or concentrated purified culture rabies vaccine (CAB)

Widely used derivatives of tetracycline, chloramphenicol, rifampicin, doxycycline, sizomycin, gentamicin, penicillin and others. According to foreign experts, the timely appointment of broad-spectrum antibiotics stops the development of diseases that without treatment in more than 95% of cases lead to death.

Including emergency prophylaxis with antibiotics in the system of protection against biological weapons, experts note the disadvantages of this method. First, it cannot be used in cases of infections against which no effective remedies have been developed, as well as in diseases caused by antibiotic-resistant strains of microorganisms. Secondly, carrying out long preventive prophylaxis will lead to sensitization of an organism. Third, according to experts, emergency prophylaxis with antibiotics can begin after establishing the type of bacterial weapon used, ie at a later date, when its effectiveness is significantly reduced.

Thus, the specific prevention and treatment of infectious diseases, the causative agents of which can be used as potential agents of biological weapons need further improvement.

2.8. Assessment of the sanitary and epidemiological condition of the troops and the area of their location. Purpose, tasks and stages

To successfully solve the problems of anti-epidemic support of troops, it is not enough to know a set of measures recommended at the present stage of development of science. The epidemic process in each disease is characterized by the peculiarity of the symptoms inherent only in it. In some infectious diseases, some measures are most effective, in others - others. The epidemic process, even with the same disease, manifests itself differently in different conditions of the social and natural environment. It also requires differentiation of measures. Therefore, the main principle of anti-epidemic support of troops in modern conditions is the allocation of the main direction of preventive and anti-epidemic measures, which is determined by the peculiarities of the epidemic process in each case and the relevant scientific recommendations. The main direction of measures for the prevention and control of infectious diseases in the planning and organization of anti-epidemic support of troops is determined using the methods of epidemiological research.

Methods of epidemiological research are grouped differently, depending on the purpose. To substantiate a set of measures aimed at eliminating the epidemic, a set of methods and methods of research, called "epidemiological survey", is used. In those cases when it is a question of a substantiation of the plan of preventive actions, the set of receptions and methods of research which has received the name "epidemiological analysis" is applied. The selection of measures to prevent the introduction of infection in the troops is carried out on the basis of SEI data and sanitary and epidemiological surveillance.

To de termine the criteria for assessing the sanitary and epidemiological condition of the troops, it is necessary to conduct an epidemiological survey of foci of infectious diseases, followed by epidemiological analysis, as well as biological intelligence, which allows to identify the use of biological weapons and identify used weapons.

Epidemiological examination is the identification of the causes and conditions of occurrence and spread of infectious diseases among the personnel of the troops in order to justify measures to eliminate the epidemiological center. An epidemic outbreak is a place of possible infection within certain limits of time and space. An epidemic outbreak in which recurrent disease has not occurred is considered to be an outbreak with a single

disease. In cases where recurrent diseases occur in the cell. talk about a cell with multiple diseases (outbreak, epidemic).

To determine the criteria for assessing the sanitary and epidemiological condition of the area where troops are located, biological reconnaissance is needed, as well as the systematic conduct of SEIs, which is an important measure to prevent the introduction of infectious diseases into the troops.

Sanitary and epidemiological intelligence is a set of measures for anti-epidemic support of troops, performed by the entire medical service and aimed at continuous and timely compliance with reliable information about the possible introduction of infectious diseases into troops by civilians, other non-military contingents, enemy troops or natural forces. territory of the location of his army.

SEI is carried out at each movement of troops, in the process of preparation for hostilities, during their conduct and after the end.

There are special requirements for SEIs. It should be:

-continuous, because in conditions of changes in the situation requires constant updating of information;

-effective, not only to identify epidemic danger, but also, if possible, to eliminate it;

- echeloned, ie to be carried out by all medical workers and to be organized by each chief of medical service in the area of placement of the part, connection, establishment;

-consistent, so that the information obtained by subordinate units of the medical service, and used by management;

- purposeful, ie to be carried out in accordance with the peculiarities of the operational and tactical situation in the interests of anti-epidemic support, first of all groups of troops performing the main combat tasks;

-the data obtained must be reliable and timely.

The main methods of SEI are direct inspection of the facility, surveys of residents, inspections, sampling of the environment and material from infectious patients for laboratory tests, use of ready-made documents, obtaining information

from local authorities and health workers. Physicians who perform SEIs are provided with tools for sampling and material from patients. In the sweat, the SEI is conducted by a medical instructor, in the battalion by a paramedic, and in the regiment by a doctor. In doing so, they perform yci elements of medical intelligence, including SEIs, may act alone or in groups that perform multilateral intelligence in the interests of various services.

The most responsible tasks of the SEI are performed by specialists of sanitary and epidemiological institutions. Specialists are provided for this purpose, who are provided with transport, laboratory equipment, in some cases - mobile laboratories and disinfection and shower units.

There are four organizational stages in conducting a SEI: the preparatory period, planning the main activities to ensure intelligence, conducting intelligence, preparing a report on the results with conclusions and proposals.

During the preparatory period, the task is clarified, the operational and sanitary-epidemiological situation is studied according to the available documents, and the topographic map of the district is studied. Information on the operational and tactical situation is obtained from commanders and staffs. At the same time, it is important to find out the routes of troops and the area of future action. Information on the sanitary-epidemiological situation is obtained in the study of medical-geographical descriptions and from senior medical officers. It is important to take into account the variability of the epidemiological situation and the possibility of unforeseen situations.

During the planning of the main activities to ensure intelligence, the composition of groups is determined, specific tasks are set for executors, material equipment and transport are allocated, routes and objects of reconnaissance are determined, forms of communication and terms of carrying out, the order of information are established. The main objects of SEI are settlements, separate houses, certain areas of the territory, roads, ie those objects that may pose a danger in terms of introducing infectious diseases into the army or their spread.

During the reconnaissance solve the tasks:

-detect infectious patients among the civilian population, in the identified centers conducts anti-epidemic measures;

-detect natural foci of zoonotic diseases and find out their activity;

-detect epizootics among farm and domestic animals, among synanthropic rodents;

- find out the sanitary condition of the population, settlements, territory and water sources;

-detect possible vectors of infectious diseases with a transmissible transmission mechanism;

- find out local resources (sanitary-epidemiological stations, sanitary checkpoints, etc.) that have anti-epidemic significance;

- find out the system of anti-epidemic services for the civilian population;

-if necessary, take samples from the environment and material from patients for the next laboratory study;

- in order to clarify the sanitary and epidemiological condition of enemy troops, it is possible to interview prisoners of war and obtain data from officials who have such information.

All the collected information is passed to the chief who organized the reconnaissance in the form of an oral report or a written message (report card of the sanitary-epidemiological spy), which consists of two parts: topographic and descriptive. The topographic part includes a map-scheme of the surveyed object. The descriptive part (legend) contains information collected during the investigation, substantiation of the sanitary-epidemiological condition of the district and proposals on the necessary anti-epidemic measures among the local population and prevention of infectious diseases in the troops. On the basis of reporting cards of sanitary-epidemiological spies, epidemiological maps are compiled, which is an important operational document used in the planning of military operations.

2.9. Forces and means of sanitary and epidemiological intelligence

According to the experience of the Second World War, the SEI in the existing troops is divided into military, army and front. Military SEI, carried out by forces and means of military medical service, is carried out on all territory from the front edge to back of connection by the order of the chief of medical service. The main task is to identify foci of infectious diseases among the civilian population. It involves the entire medical staff of units, units and formations (sanitary instructor in the pot, paramedic in the battalion, doctors in the regiment and division).

The company's medical instructor, battalion paramedic, and regimental physicians can solve only a fairly limited range of issues in terms of their place in combat and the level of special training. Therefore, when setting tasks, it is necessary to specify the objects on the basis of available information and take into account the real possibilities in determining the amount of data that needs to be collected.

A more qualified SEI is conducted by specialists of the sanitary-epidemiological laboratory, which carries out reconnaissance mainly in the direction of the main strike of the division and on the routes of transportation and evacuation of the wounded. The head of the laboratory summarizes the intelligence data received from the entire medical staff of the division in the form of an oral or written report. The results of the investigation can be issued in the form of a report card. Specialists of the laboratory conduct a re-examination of epidemic outbreaks identified by the medical service of the regiments. On the basis of all collected materials the necessary measures directed on prevention of introduction of an infection in armies are defined. In the military, these measures are usually limited to the identification of cells identified during reconnaissance and the orientation of troops to limit contact with them.

The Army SEI extends to the entire territory and settlements from the military to the army rear and is conducted by the medical service of all rear units and formations of the army subordination. It is organized by the head of the medical department of the army (at the suggestion of the army epidemiologist).

Exploration of the most important objects is entrusted to the specialists of the sanitary-epidemiological institution of the army, who also organize epidemiological surveys and measures to localize the identified foci. It is advisable to create special groups (detachments) that not only clarify the situation, but also actively change it. The number of groups and their composition are determined by conditions. Each group is assigned a

specific territory or specific settlements and is tasked with a maximum survey of the army territory shortly after its release in order to identify and disinfect epidemic outbreaks. An important role in the study of the army territory belongs to medical institutions, which must conduct reconnaissance not only in the occupied settlement, but also around it - in the area of 3-5 km. During offensive operations with the rapid advance of troops, the army SEI cannot ensure the study of the entire liberated territory. In this case, the main attention should be paid to the area of the army command post and the main communications through which the troops are provided, as well as to the adjacent territory (at a distance of 5-10 km). A more thorough study of the territory is carried out by the front forces.

Frontline SEI is carried out throughout the front from the army to the front rear. It is organized by the chief of the military medical department of the front on the proposal of the chief epidemiologist of the front and is conducted by the medical staff of the rear units and formations of the front subordination. Reconnaissance of the most responsible objects (frontline communications, road junctions, areas of deployment of hospital bases, supply bases, control points, etc.) is carried out by front sanitary and epidemiological institutions. These institutions are involved in the elimination of epidemic outbreaks, sometimes releasing military forces and facilities that carried out primary measures in the outposts. The front line is carried out by the SEI, based on the results of military intelligence and additional data obtained from various sources. According to the experience of the Second World War, it is expedient to form epidemiological brigades (detachments) from the frontal anti-epidemic forces and means with the use of the reserve medical staff. Frontline epidemiological brigades are usually sent to large epidemic centers, which are detected by military intelligence. The liberated army groups follow the troops.

The medical service of units and connections conducts reconnaissance on the territory between the demarcation lines. The medical service of the rear institutions, including medical and evacuation ones, carries it out in the area of placement within the radius determined by the superior (3-5 km). Sanitary and epidemiological institutions are entrusted with objects or routes of reconnaissance. Thus, the entire front area, from the

front edge to the rear border of the front, is subject to sanitary and epidemiological examination. At each stage of medical evacuation, according to its capabilities, a part of the general intelligence task is assigned, the obtained data are used first of all for the organization of anti-epidemic support of its part. Such an organization of intelligence requires consistency in work, clear information about its results and constant readiness to provide assistance to the subordinate unit. Even qualified intelligence without the organization of a permanent connection turns into a collection of information that has no operational value.

Organizational forms of the SEI may vary depending on the nature of hostilities. In defense, its entire territory is surveyed on the principle of zoning. After identifying adverse factors and eliminating them in the territory occupied by troops, the SEI gives way to sanitary and epidemiological surveillance, which consists in the systematic receipt and updating of information on the sanitary and epidemiological condition of the area of troops. When organizing sanitary-epidemiological surveillance, the territory of the troops is divided into districts assigned to individual medical workers, medical units, medical and sanitary-epidemiological institutions.

In the period of preparation for the offensive and in the course of its SEI is conducted "in front of the troops", "together with the troops" and "after the troops". To conduct it "in front of the troops", data of medical-geographical descriptions and statistical materials of health care bodies, information of the medical service of the troops operating in the enemy's rear, intelligence data, results of interrogation of prisoners of war, captured orders and orders of the enemy concerning medical support of troops are used. etc. SEI "together with the troops" and "following the troops" is organized according to the situation. Thus, in the period of preparation for the operation, when the regrouping of troops is underway, the main focus of the military SEI is on the routes of troops and their areas, and the army and front - on the army and front roads. During the offensive, reconnaissance personnel do not leave the troops. When the troops complete the offensive and proceed to consolidate the occupied frontiers, the medical service carries out sanitary and epidemiological surveillance. Under these conditions, it is possible to better

understand the situation and take the necessary measures, the importance of which is determined by the increased contact of troops with the local population.

According to the experience of the Second World War, the most reliable data on the sanitary and epidemiological situation can be obtained by the medical service as a result of a direct inspection of the reconnaissance object by qualified forces. The reliability of the data increases when laboratory research methods are used. For this purpose, field portable kits and mobile laboratories of sanitary and epidemiological institutions are used.

Of undoubted value are various official documents that contain epidemiological information. However, the variability of the epidemiological situation always requires clarification of the materials contained in these documents. The data obtained from prisoners of war, especially captured medical workers, are of some value. However, these data are limited to information about individual units and parts. The materials obtained from the population survey also need to be carefully checked.

The effectiveness of the SEI is determined by the fact that, firstly, its results are used in planning measures aimed at anti-epidemic support of troops, and secondly, the rapid and effective impact on identified epidemic outbreaks. To do this, the organization of intelligence can not be limited to general instructions on the need for it. It should be specified who, when, on what issues, to what extent and in what objects will conduct reconnaissance, provide clear deadlines and forms of reports, as well as methods of delivery.

For example, in Afghanistan, during the SEI, samples were usually delivered in several stages, which included sending them from the combat area to the SEL division (brigade) or hospital by vehicle (ground or air) to evacuate the wounded and sick, then to the army SEZ laboratory as as a rule, Mi-8 MT helicopters. In some cases, direct delivery of material from the place of taking to the SEZ laboratory by a sanitary helicopter by non-stop and "relay" method, bypassing the SEL stage, was proposed and tested.

The latter method was envisaged, if necessary, to transfer to the final destination the material to be laboratory tested, with the crew of a helicopter

departing from an intermediate aerodrome (airport) in Kabul. The complication of the organization, associated with the involvement of the medical service of the airfield or OMedB of a particular connection, the rapidity of combat operations did not allow to work out all the elements of this option and widely apply it in practice.

Each armed conflict has its own specific forms and methods of conducting SEIs and monitoring the sanitary and epidemiological condition of troops and territories. Obviously, the scientific development of this question is of great practical importance.

During the war in the Chechen Republic, three mobile sanitary-epidemiological groups began to operate, consisting of an epidemiologist, a hygienist, a bacteriologist, and a medical field laboratory, which operated in the main areas of hostilities of the Russian troops. They carried out qualified SEI, localization and elimination of foci of infectious diseases, vaccination of soldiers, disinfection measures, necessary laboratory tests.

In emergencies, the group's specialists study information about the sanitary and epidemiological condition of the district, obtained from various sources, as well as inspect the area, water supply sources and other facilities, take samples for research. To clarify the epizootic situation, the group may include a zoologist, entomologist, who study the species and numerical composition of animals (rodents, arthropods and other potential sources and vectors of natural focal infectious diseases).

When surveying a large area, it is advisable to use a helicopter. The obtained materials are subject to analysis, laboratory research and identification. In addition to the study of samples of materials from the natural focus, a thorough epidemiological examination of each case of fever with the use of laboratory rapid diagnostic methods should be performed. Based on the assessment and analysis of the results obtained by intelligence and epidemiological surveillance, urgent anti-epidemic measures are determined and recommendations are developed to the command and medical service.

2.10. Sanitary and epidemiological investigation and surveillance

for natural focal infections

In the conditions of field deployment of troops in peacetime, or, especially, in wartime, it is important to protect personnel from natural diseases, which is achieved through the use of a set of preventive and curative measures.

Natural focal infections are a group of diseases whose pathogens circulate in the natural complexes of a certain area. They are characterized by specific features of epizootic and epidemic processes. Natural foci of infection continue to be a pressing public health problem as the number of naturally occurring diseases increases. Pathogens are viruses, rickettsiae, bacteria, protozoa, fungi and more. Natural focal diseases that occur in Ukraine include tularemia, anthrax, leptospirosis, Lyme disease, opisthorchiasis and others.

Laboratory diagnosis of natural focal infections is important in epidemiological surveillance. There are both general and individual problems due to the specifics of working with each infection and the degree of its study.

The traditional methods of laboratory diagnostics are visibly insensitive. However, for the rest of the decimal for the diagnostic purposes of the disintegration of the method of molecular biology: DNA probes, DNA hybridization, polymerase lance reaction. New methods are distinguished by a high specificity and sensitivity and quick analysis.

Among the preventive measures, SEI and military-epidemiological assessment of infectious diseases, which is an integral part of the general SEI, are crucial.

The SEI of natural foci of infectious diseases consists of organizational and special (epidemiological, parasitological, microbiological, etc.) measures of the medical service, which are carried out in order to quickly identify and military-epidemiological assessment of these foci in the territory of deployment and combat operations. It is necessary for the timely adoption of the most effective measures aimed at preventing the spread of infectious diseases among personnel.

The main measures of SEI natural centers are:

-collection and study of publications and other available information about the territory, as well as the incidence of human and animal natural focal diseases;

- reconnaissance survey of the defined territory, selection of objects for carrying out researches and key sites for collecting material and realization of zoological and parasitological researches;

- collection and delivery from the examined biotopes of vertebrates (probable sources of the pathogen) and arthropods (vectors), as well as other materials;

-laboratory rapid analysis of collected zoological and parasitological materials and sera of humans or animals;

-identification of patients and their epidemiological examination;

-military-epidemiological assessment of the identified foci.

The following are subject to study:

-general intelligence and intelligence data;

-medico-geographical (epidemiological descriptions of the theater of operations or individual areas;

-reports and market surveys of infectious diseases of local health authorities (including apxivni);

-scientific and other literature on research conducted in the area, WHO annual bulletins and other scientific and practical materials;

-materials of surveys of local residents (especially hunters, shepherds, industrial workers, etc.), prisoners of war and other persons.

The main tasks in the study of these materials are:

-determination of features of climate and landscapes of the studied area;

-receiving data on the species composition and number of vertebrates and arthropods - potential sources or vectors of blood infections;

-epidemiological analysis of data on the incidence of natural focal infections and invasions;

-study of survey areas on a map with drawing on it routes of movement, definition of key sites for gathering of field material;

-drafting a specific plan of survey of the territory in order to identify natural foci of blood diseases.

In the concrete plan of inspection of the territory objects of reconnaissance and stages of work with calculation of time for movement, inspection, registration of results, etc. should be provided. Below is a variant of the form of the plan of organization and carrying out of SEI of natural centers of infectious diseases.

Reconnaissance of the area to be surveyed is carried out in order to directly (personally) acquaint medical professionals with the general features of the landscape and terrain, as well as its inherent biocenosis.

Variant of the form of the plan of the organization and carrying out of SEI of natural centers

№	Composition of the group (list of specialists and support staff)	Main task	Objects (survey areas)	Stages of work	Material equipment	Vehicles	The order of delivery of samples	Communicati and cont system

Given that a continuous survey of a given area is unlikely, the task of reconnaissance primarily involves identifying and selecting "key" areas, ie those typical habitats (stations, etc.) where rodents or other small mammals and blood-sucking arthropods are likely to congregate. Selective comprehensive survey of such habitats will transfer the results to the entire surveyed area.

The main method of reconnaissance of the territory by medical service specialists is a detour (bypass) and inspection of the area, especially those areas where troops, control points, hospital bases, supply bases and other facilities are already located or can be deployed.

During reconnaissance in large areas, it is most appropriate to examine it from the air. Along with a general overview and assessment of the landscape with all its inherent features, this method involves aerial surveying of the area with mapping at certain landmarks of the visible boundaries of biocoenotic complexes, which then highlight the "key" areas to be surveyed.

The main indicators of the boundaries of biocoenotic complexes are the nature of the locality, ie the landscape features of the territory. In particular, when choosing "key areas" it is necessary to determine:

-character and degree of uniformity of the main landscape (forest, steppe, desert, etc.);

-presence, type and frequency of certain structural elements of the landscape (stations, tracts, etc.);

-joints of landscapes (places of transition of some natural complexes to others), for example forest - steppe, foothills - sandy desert, etc .;

-vegetable associations, which are good indicators.

With a monotonous landscape (steppe, desert, etc.) it is enough to select 2-3 full-fledged points (typical biotopes) for the survey. If the landscape is mosaic, then the stations typical for this area (forest areas, meadows, arable land, river valleys) and, especially, the joints between them are subject to inspection.

All selected "key areas" (habitats) are plotted on a map, and appropriate groups of specialists are sent to them for zoological and parasitological examination.

All selected "key areas" (habitats) are plotted on a map, and appropriate groups of specialists are sent to them for zoological and parasitological examination.

Zoological and parasitological examination of selected "key areas" should be comprehensive. Depending on the situation, it can be single or multiple. The latter is more reliable and provides not only short but also long-term prediction of the epidemiological significance of the natural center. However, such a survey requires a long time and is hardly possible in the context of modern hostilities, when most

often a one-time comprehensive sample survey of locality will be conducted, which provides:

- thorough inspection of the area and study of documentation (description, map-scheme) of the survey site;

-preliminary assessment of the species composition, number, daily activity and places of reservation of rodents or other small vertebrates (birds), as well as arthropod vectors (mites, blood-sucking biplanes, fleas, etc.);

-mass collection of background species of animals, which are intended as sources and vectors of pathogens;

- active search and collection of dead rodents (including mummified ones) and other small vertebrates, as well as predatory mammals, bird droppings or other materials, the research of which can provide valuable information;

- blood sampling in rodents and other wild and farm animals (birds), as well as in people who have been in the survey area for a long time;

- packing and delivery of the collected materials in the conditions providing their full storage for the subsequent express analysis and excluding a possibility of loss in npoceci of transportation.

The volume and direction of zoological and parasitological examination depend on the nature of the landscape-climatic zone, the season of the year and the features of the studied biotope.

The zoological and parasitological materials delivered to the sanitary-epidemiological laboratories are subjected to laboratory examination after analysis and sorting. The purpose of rapid analysis is to identify the circulation in the study area of pathogens of natural foci of diseases dangerous to the army, and the identification of pathogens.

Insufficiently studied nosogeography of a number of natural focal infections complicates the planning and implementation of preventive measures. In this regard, the actual certification of natural resources according to unified schemes. For example, the obtained data on the boundaries of the cell, the number and distribution of carriers and vectors of pathogens, the intensity of the epizootic

process, the incidence of the native population, farm animals are plotted on the map. For this purpose, the territory of the natural center is divided into primary areas, each with an area of 400 km2 (square 2020 km). The boundaries of the primary areas are tied to a cartographic grid (map sheet 1: 100,000 is divided into 4 primary areas). In turn, the primary district is divided into 4 equal sectors. In each, constant point landmarks are chosen, according to which all places of material collection are addressed in the future for the selection of pathogens of epidemic and epizootic manifestations of the cell.

The cell area is indicated by an eight-digit code: the first six are assigned to the map sheet cipher, scale 1: 100,000, the next, the seventh, digit (from 1 to 4) - the code of the primary area and the last, the eighth (from 1 to 4), -code primary district sector.

Due to the uneven deployment of troops in natural foci, epidemiological zoning of foci is important, which is carried out in order to isolate areas (primary sector) where epidemic complications are likely. The main criteria of epidemiological significance of the primary district sector are the activity of the natural center in a certain area and the location of troops in this area, indicating the ways of their movement, transportation of material resources, communications, etc.

Epidemiologically significant areas on the map should be highlighted. A tablet (scale 1: 100,000) is drawn up for each such territory (sector), on which the deployment of military units (units), communications, ways of movement of personnel, transportation of material resources are displayed. Such a system of division of the territory, its binding to the geographical grid allow to automate the tracking of natural centers with the use of personal computers. The development of applied computer programs for the sanitary-epidemiological institution with data on the sector of the primary district (according to the digital code), cell boundaries, state of epizootics, deployment of troops in it allows to conclude possible (degree of probability) epidemic complications for each (subdivision), which, in turn, is the basis for planning field surveys, the scope of preventive measures.

An important component of anti-epidemic measures is a scientifically based prognosis of morbidity. As a rule, infectious diseases are the result of complex intrapopulation and biocenotic processes in the natural focus. Therefore, the analysis of long-term dynamics of morbidity in a number of cases allows predicting its tendency in subsequent years. When making forecasts, it is necessary to take into account a large number of factors affecting the incidence rate, and to have quantitative characteristics of the activity of natural foci. It is necessary to conduct long-term and purposeful observations, organize monitoring of key areas located in various natural-territorial complexes in the areas of deployment of military contingents.

With the aim of scientifically based complex prevention of zoonoses, there is a need to develop specific organizational measures: identifying factors that determine the peculiarities of the territorial distribution of natural focal infections, preventive vaccinations, active detection of patients with zoonoses, constant epizootic surveillance in cells, training of personnel, units, units and institutions of the medical service, to work in a strict anti-epidemic regime, pest control and deratization, sanitary and educational work.

The methodology for assessing the degree of epidemic danger of infectious diseases in emergency zones is quite simple, convenient and does not require complex mathematical calculations. Its most significant parameters: pathogenic infectious agent, contagiousness (expressed by the contagious index), the number of cases and the number of alleged sanitary losses, mortality, the number of contact persons and the need for their isolation (observation), the size of the epidemic (local level, local, territorial, regional, federal , transboundary).

The characteristic signs of emergencies caused by an epidemic or the threat of its occurrence are assessed: the risk of the introduction and spread of the disease among the population, the possibility of a large number of cases, the characteristics of the severity of the disease, leads to disruption of health or death, the impossibility of local (regional) health authorities and services to cope with the emergency due to the lack and shortage of medical forces, the necessary pecypses and equipment, the danger of the spread of infection on an international scale.

The epidemic risk of infectious diseases should be divided into low, moderate, high and very high. The calculation of sanitary losses is carried out according to the standard method. The possibility of eliminating the outbreak is assessed by the available forces and means. Determining the degree of epidemic risk of infection in an emergency will also depend on the endemicity of the disease.

Determining the degree of epidemic danger is one of the necessary components of an epidemiological diagnosis. The degree of danger is also determined by endemicity, the size of the endemic zone and the need for the forces and means of health care and sanitary and epidemiological services. Using this technique for determining the danger of an infectious disease, it is possible to determine the directions of the activities of the health authorities and the sanitary-epidemiological service, the need for evacuation and quarantine and isolation-restrictive measures, which will reduce the number of victims of epidemic emergencies.

Criteria for assessing the sanitary and epidemiological state of troops and the area of their deployment:

it is accepted to allocate four degrees a dignity. - epid. states: prosperous, unstable, unsuccessful, extreme. San.-epid. the state of the unit is considered successful if there are no infectious diseases among the special composition or sporadic cases are registered that are not related to each other and are characteristic of this region, and there is also no data on the use of biological weapons by the enemy.

Unstable dignity. - epid. the state of the part is considered when individual cases of infectious diseases are recorded that have not previously occurred, as well as with a slight increase in the sporadically level or the occurrence of individual group diseases without a tendency to further spread.

San.-epid. The state of the military formation and the area of its location is assessed as unfavorable in the event of group outbreaks of infectious diseases in the presence of conditions for their further spread, in the case of the use of

biological weapons by the enemy or the registration of isolated cases of especially unsafe infectious diseases (plague, cholera, hemorrhagic fevers).

San.-epid. The state of the unit is considered extraordinary when an epidemic of an infectious disease or group cases of especially dangerous infectious diseases has arisen among the military (population), due to which the formation has lost its combat capability. By order of the commander of the army (front), a state of emergency is declared in the region.

Analysis of the participation of the medical service in the elimination of the medical and sanitary consequences of emergencies showed that the SR should include the following measures: clarification of the scale of the outbreak, the amount of sanitary losses, the forecast of the consequences of emergencies and the timely transfer of information to the management body of the medical service; collection of data on the medical and sanitary situation, the boundaries of the epidemic focus, exchange of information with intelligence units of other services; determination of the places of deployment of medical units, units and institutions, optimal ways of evacuation of victims, risk factors affecting the deterioration of health; biological hazard assessment, radioactive, chemical pollution of the area and the environment;

Expert examination of drinking water, food products and food raw materials with the issuance of an opinion on their suitability for consumption; participation in the selection of a place for the placement of rescue units and points for the processing of people and equipment; assessment san - epid state of the accident area; special laboratory studies and organization of emergency prevention among personnel, population, members of emergency rescue teams.

The implementation of these activities occurs in three modes: 1. Everyday activity 2. Increased readiness 3. In an emergency mode.

According to the dignity system operating in the Armed Forces. supervision, depending on the type of state of emergency, in the organization and conduct of medical reconnaissance, one or another non-standard formation of sanitary and epidemiological institutions is involved. Requirements for units conducting

sanitary and epidemiological reconnaissance: the ability to conduct medical reconnaissance, high mobility and maneuverability, the ability to independently advance to a given area, autonomy of work and sufficient protection from the effects of various damaging factors. automation of the processes of collecting, processing information and issuing conclusions, the possibility of conducting a dignity. supervision in any state of emergency.

A systematic approach to sanitary and epidemiological reconnaissance can be carried out in two stages: the first stage is reconnaissance in the affected area itself; the second stage is to conduct additional research and assess the condition as a whole with the help of mobile specialized laboratories deployed in the affected areas, which are provided with sanitary and epidemiological institutions.

The main tasks of the mobile sanitary-epidemiological laboratory personnel in an emergency mode are:

- arrival in the area of emergency, clarification of the situation, establishment of interaction with the headquarters of the emergency;
- sampling from environmental objects and material from patients, indication of pathogens with simultaneous delivery of samples to the laboratory of the institution;
-participation in establishing the boundaries of the outbreak, defining the boundaries of the quarantine and observation zones;
-laboratory control over bacterial contamination of food products;
-organization of emergency non-specific and specific prevention;

Providing organizational and methodological assistance;

-laboratory control over disinfection;

Providing assistance to the medical service of the garrison in carrying out planned preventive and anti-epidemic measures;

-participation in the establishment of anti-epidemic barriers;
- Coordination of issues related to the burial of human and animal corpses;

-information support of the command about the degree of risk of infection, participation in the preparation of draft orders, development of plans for anti-epidemic protection of troops;

- submission of reports to the senior chief of the group of medical forces and means for liquidating the consequences of the emergency, on the results of medical intelligence, forecasting the necessary measures and needs.

Sanitary and epidemiological reconnaissance is a mobile dignity. - epid. a laboratory, the capabilities of which allow it to fulfill the tasks that it faces. The mobile sanitary-epidemiological laboratory microbiological department can be located in the vicinity of the outbreak and make microbiological determinations of samples. It is planned to provide medical intelligence groups with specialized mobile modules of the medical and ecological complex.

At the stage of the analytical cycle, methods of epidemiological diagnostics are used, which should answer three questions: 1. the problems of anti-epidemic protection of troops and their protection from biological weapons are urgent; 2. where and when these problems form and can take effect; 3. What conditions form these problems. Therefore, planning is considered as the main link in the management of anti-epidemic defense of troops and their protection from biological weapons.

2.11. Basics of organizing biological prospecting and indication of biological agents

The biological (bacteriological) situation is assessed based on the results of biological prospecting. Biological (bacteriological) reconnaissance - a set of measures carried out by the command, intelligence agencies and individual services to obtain information about the use of biological weapons by the enemy and the types of biological means used in this. The management of biological prospecting in the compound (unit) is assigned to the medical service. It is conditionally possible to distinguish three groups of tasks solved by biological prospecting:

- collection and generalization of intelligence data on the capabilities, intentions and preparation of the enemy for the use of biological weapons;

-Indication of biological agents;

- tentative determination of the scale of a biological attack.

In anticipation of the use of biological weapons by the enemy, the first task of biological reconnaissance is carried out - the collection of information about the intentions of the enemy.

The indication of biological agents is understood as the whole complex of measures aimed at establishing the use of biological weapons by the enemy and the type of the agent used. Determination of the fact that an adversary has used biological weapons is called non-specific indication. Determining the type of pathogen used in this case is called a specific indication. Therefore, a nonspecific indication is carried out at the time the enemy uses a biological weapon, and a specific one - when eliminating the consequences of a biological attack. For the implementation of the indication, the forces and means of the chemical troops and the medical service are mainly used.

Non-specific indication of biological agents.

This indication is carried out visually and with the help of special devices. Visually, there are indirect or external signs of the use of biological weapons:

- the formation of an aerosol cloud behind the course of enemy aircraft or in places where missiles, shells and bombs explode;

- weak explosions of ammunition

- identification of the remains of containers and ammunition, the appointment for equipping with biological agents;

- finding droplets of liquid and powdery substances in soil, environmental objects;

- identification of an unusual accumulation of arthropods and small animals in the area.

Visual determination of the fact of the use of biological weapons is ineffective, because visibility is limited, the aerosol cloud may be invisible. More efficient use

of special aerosol signaling devices capable of registering the total amount of particles suspended in the air (particle counters), and devices signaling the presence of protein particles (bacteria). The analytical action of these alarms is based on physical or physicochemical methods for detecting microbial protein, the concentration of which exceeds the background values (without determining the species of biological agents). This enables fast analysis and instrument operation in observation mode.

A nonspecific indication of biological means is carried out in the combat formations of troops and in the location of rear units and institutions.

Reconnaissance units carrying out non-specific indication have the following duties:

-continuous carrying out of nonspecific indication by visualization of external signs of the use of biological weapons and with the help of devices;

- notification of the detection of the fact of its use along the command line;

- taking samples from environmental objects in places suspicious of the use of biological weapons;

- delivery of samples to the laboratory.

Specific indication of biological agents. Stages of a specific indication.

Specific indication involves determining the type of biological agents used. It is an essential element of biological intelligence, as its results provide targeted defenses against biological weapons.

Sampling in foci of biological contamination is the responsibility of the chemical, medical and veterinary services. Specific indication of biological agents is organized and carried out in a certain sequence: sampling from environmental objects and material from patients, transporting samples to the laboratory, conducting the most laboratory studies to establish the type of biological agents used.

The first stage of specific indication of biological agents (sampling).

Sampling persons should have special equipment with thermal insulating containers:

The following are subject to selection:

- air samples in the surface layer of the atmosphere and in the rooms of unpressurized objects;
- fragments, shells and maintenance of enemy biological munitions;
- raids from powdery substances, liquid drops and other suspicious objects on military equipment and terrain near the place of the explosion of ammunition
-washers from the surface of weapons and military equipment, other objects, plants that were in the path of the aerosol cloud in the immediate vicinity of the source of its generation;
-samples of water from open reservoirs, wells, containers, with suspicion of pollution;
-insects and ticks, as well as the corpses of animals (rodents), which suddenly appeared in the area where troops are located near the discovered containers or places of explosion of other biological ammunition
- washes from the mucous membranes of the nose, nasopharynx and skin of people who were without protective equipment in the zone of distribution of biological aerosol;
-blood, stool and other materials from unexpectedly ill persons, as well as pieces of internal organs and tissues of corpses of people who died from infectious diseases;
- materials from sick animals and their corpses.

Samples are taken in a gas mask and protective clothing in compliance with the rules for working with pathogens of especially dangerous infections.

Taking samples in foci of contamination with biological agents

Indications for sampling	goal	Place of taking	Who is taking samples	Funds
Positive results of non-specific indication of biological	Taking materials, the most suspicious	In the focus of infection and at stages	Intelligence units, other reconnaissance units and	Special selectors and sets.

agents; emergence of infectious diseases among people and animals.	biological agents for departures to laboratories.	medical evacuation.	observation posts.	

Sampling for specific indication of biological agents in troops, units and rear services is carried out using standard means of chemical and biological reconnaissance. The medical service is equipped with a medical sampling kit. The procedure and technique for taking samples with these means are determined by the instructions for use.

Each sample that is sent to the laboratory must be accompanied by an accompanying note (direction), in which the following is noted: to whom and where the sample is sent, the name of the material, the place and time of sampling, the basis for sampling (positive results of non-specific indication of biological agents, the appearance of infectious patients, etc.), information about the presence of poisonous and radioactive substances in places of detention, the time and the intended method of using biological agents, position and rank, the name of the person who took the sample.

The second stage of specific indication of biological agents (transportation). From the place of sampling, they are first delivered to the nearest laboratories by those intelligence units that made it, including medical workers. Half of each sample remains for research in the specified laboratories, the other half is sent to the laboratories of sanitary and epidemiological institutions. In this case, transportation is carried out by the forces and means of the medical service.

Samples are transported in special containers. Each package is treated from the outside with a 10% solution of bleach or another disinfectant, but so that this solution does not penetrate into the package.

The third stage of specific indication of biological agents (laboratory tests). Laboratory research can be carried out according to the reduced and expanded schemes. The abbreviated scheme for indicating biological agents is used when analyzing material for the presence of botulinum toxin, anthrax pathogens, plague and cholera. The extended scheme is used when examining the presence of the most probable causative agents of bacterial infections (plague, anthrax, cholera, melioidosis, etc.), rickettsioses (Q fever, typhus, etc.), viral infections (smallpox, yellow fever, etc.) , deep mycoses (coccidioidomycosis, nocardiosis, histoplasmosis, etc.) or toxins (botulinum, tetanus, etc.).

Specific indication of biological agents according to abbreviated and extended schemes is carried out using only express analysis methods, which include the method of fluorescent antibodies, the reaction of indirect hemagglutination, the reaction of inhibition of hemagglutination, radio immune and enzyme-linked immunosorbent assay, and more recently, the polymerase chain reaction.

Military medical laboratories perform indication of biological agents according to an abbreviated scheme, laboratories of sanitary and epidemiological institutions - according to an expanded scheme.

The volume of indicator studies, and their focus, is established by the head of the medical service of the association. The order of sending samples is determined at the same time.

Organization of the work of laboratories deployed for indication biological agents

In organizing the work of laboratories that indicate biological agents, one should be guided by the following principles: the formation of functional groups in laboratories that provide the main stages of research; assignment to each group of equipment; deployment according to certain rules.

The formation of functional groups consists in the selection of a group of primary processing of the material, a group of indication of toxins, bacteria, rickettsia, pathogenic fungi, a group of indication of viruses, a support group.

The deployment procedure provides for an isolated location of functional groups, the ability to maneuver the forces and means of the laboratory, the security of the laboratory, continuous communication with higher authorities, compliance with a strict anti-epidemic regime. It provides for the allocation of a strict regime zone (functional groups are located) and a restricted zone (personnel, service units), communication between zones through a sanitary inspection, personnel wearing anti-plague suits in a strict regime zone, systematic disinfection measures, compliance with the rules for working with contaminated material, vaccination staff.

2.12. Security questions:

1. What are biological weapons?
2. Methods of using biological weapons.
3. Technical means of delivery of biological ammunition.
4. Types of biological weapons.
5. Requirements for biological weapons.
6. What factors influence the damaging effect of biological weapons?
7. Signs of an artificial epidemic process.
8. Basic principles of anti-epidemic protection of troops.
9. Biological weapons protection measures carried out pending use, at the time of their use.
10. Basic personal protective equipment against biological weapons.
11. Collective means of protection against biological weapons.
12. How are drugs used for specific prevention of infectious diseases?
13. What types of vaccines do you know?
14. Methods for disinfecting objects.
15. What is SR and what are its main tasks?
16. Criteria for assessing the sanitary and epidemiological state of troops and the area of their location.
17. The main tasks of the sanitary and epidemiological reconnaissance during emergencies.
18. What is biological intelligence?
19. What are the main tasks of biological prospecting?
20. Content and organization of non-specific indication of biological agents.
21. Maintenance and organization of specific indication of biological agents.
22. Stages of specific indication.

2.13. Self-control tests

1.In the city, sporadic cases of infectious diseases are recorded among the population. Indicate the epidemiological assessment of the state of the area

A Unstable

B Safe

C Dysfunctional

D Emergency

E Everything above is wrong

2.In the city among the population, sporadic cases of infectious diseases with a tendency to spread are recorded. What is the epidemic condition in the area?

A Unstable

B Prosperous

C Dysfunctional

D Emergency

E Everything above is wrong

3. Isolated cases of cholera are recorded among the population. Indicate what is the epidemic state in the area?

A Unstable

B Prosperous

C Dysfunctional

D Emergency

E Everything above is wrong

4. A plague epidemic broke out among the population and the military. Indicate what is the epidemic state in the area?

A Unstable

B Prosperous

C Dysfunctional

D Emergency

E Everything above is wrong

5. A chlorine leak has occurred in a working area of the city. What diseases are expected to increase?

A Intestinal

B With kidney improvement

C With respiratory tract damage

D With damage to the musculoskeletal system

E With bone marrow damage

6. In the area of the city at a meat processing plant, a leak of contaminated waste occurred. What diseases should be expected to grow?

A Intestinal

B Diseases of the respiratory tract

C Transmission

D With damage to the immune system

E Heart disease

7. There was a leak of radioactive material in the area of the nuclear power plant. What diseases are likely to grow in the near future?

A Intestinal

B Pulmonary

C Blood

D Kidney

E Diseases of the brain

8. At a nuclear power plant, a leak of radioactive substance. What diseases should be expected to grow in the long term?

A Immunodeficient

B Kidney

C Lungs

D Liver

E Muscle

9. What should be done by medical workers at the points of formation of military units?

A Medical examination to identify infectious patients, sanitization, routine vaccinations and vaccinations according to epidemiological indications

B Antibiotic therapy

C Observing the sick

D Chemoprophylaxis of contact

E All of the above is true

10. What should the medical personnel accompanying the military echelons do?

A Routine vaccinations

B Treatment of the sick

C Interview personnel on a daily basis in order to identify infectious patients, their isolation

D Sanitary treatment of personnel

E Final disinfection

11. Indicate which disease according to the rating distribution system belongs to bioagents with a high probability use as a biological weapon.

A Tularemia

B Tetanus

C Diphtheria

D Rabies

E Typhoid fever

12. Indicate which of these diseases is referred to as group 1 of pathogenicity?

A Plague

B Anthrax

C Tularemia

D Sap

E Tick-borne encephalitis

13. What regime is established by order of the unit commander immediately after the enemy uses biological weapons and before termining the type of pathogen?

A Provisional hospitalization

B Observations

C Quarantine

D Insulation

E Anti-epidemic mode

14. Under what conditions is the sanitary and epidemiological state of troops and the area of their deployment considered unstable?

A Lack of conditions for the spread of infectious diseases

B Registration of isolated cases of especially dangerous infections

C Registration of repeated cases of especially dangerous infections

D Registration of individual cases of such infections not previously encountered

E Registration of group outbreaks of infectious diseases

15. The causative agent of which of these diseases is classified as category A agents dangerous to the civilian population?

A Botulism

B KU fever

C Melioidosis

D Tick-borne encephalitis

E Gas gangrene

16. Indicate, what will be the source of aerosol formation after the explosion of such a biological combat device as an aerial bomb?

A Linear raised

B Linear ground

C Multipoint

D Multi-point

E All specified

17. What disease has the highest contagiousness index?

A Pneumonic plague

B Generalized form of anthrax

C Septic Plague

D Yellow fever

E Tick-borne encephalitis

18. Indicate the causative agent of which the disease belongs to the group of biological agents of lethal action

A Tularemia

B Brucellosis

C Q fever

D Venezuelan encephalomyelitis

E Smallpox

19. Indicate what is not included in the tasks of sanitary and bacteriological intelligence

A Clarification of the fact of the enemy's preparation for the use of biological weapons

B Assessment of the sanitary and epidemiological situation

C Establishing a quarantine regime in the lesion focus

D Identification of local means suitable for antibacterial protection of troops and population

E Study and assessment of conditions that may affect epidemiological situations in the event of the use of biological weapons

20. Indicate the signs that distinguish bioterrorism from chemical terrorism

A Difficult to determine the use of weapons

B The place of use of the weapon is easily detected

C Development of the disease within a few minutes after the attack

D Development of the disease within a few hours after the attack

E The affected are near the release site

21. Indicate signs of the use of biological weapons

A Deterioration of the quality of life of the population

B Sudden mass spread of infectious agents among humans and animals

C Changes in the demographic structure of the population

D Increased incidence of intestinal infections in the summer

E All of the above

22. In the war zone, which is not endemic for tick-borne encephalitis, a large increase in ticks infected with arbovirus was recorded. What should be suspected?

A Change of biotope characteristics

B Enemy Use of Biological Weapons

C Transfer of ticks by birds

D Changing of the climate

E All of the above

23. Select signs of the fact that the enemy has used biological weapons

A Revealing the remains of bombs on the territory

B Identification of the accumulation of rodents in the area of the deployment of troops

C Mass diseases among pets

D Mass diseases among humans

E All of the above

24. Are indirect signs of the use of biological weapons?

A Significantly increased protein levels in water

B Increase in the level of hydrogen sulfide in effluents

C Increased carbonate levels

D Increased sulfate levels

E All of the above

25. Specify the place of sampling of soil for bacteriological indication when using biological weapons

A On the slopes of the hills

B Along the rivers

C From the top layer where contamination is likely

D In the bushes

E At the location of the farms

26. Specify the method of increasing the concentration of microbes in the study of water samples

A Standing water intake

B Water intake downstream

C Water intake in crowded places

D Filtration, centrifugation

E All of the above

27. Are air samples taken for bacteriological indication of air samples when using biological weapons?

A In crowded places

B In the surface layer of the atmosphere

C In places where animals gather

D On the hills

E During the period of high sun

28. For delivery of biological material from a patient Apply

A Plastic bags

B Boxes

C Glassware

D Test tubes

E Thermal containers

29. Does the accompanying note accompanying each sample and referral to the laboratory indicate?

A Where and to whom the sample is sent

B Material name

C Place and time of sampling

D Basis for sampling

E That's right

30. Is the microbiological department of the mobile sanitary-epidemiological laboratory equipped with means for the indication of microorganisms?

A ELISA methods only

B Only bacterioscopic methods

C Serological methods only

D PCR only

E That's right

31. Specify the object of study of military epidemiology

A Infectious disease, ways of its spread among personnel

B A military collective with all its inherent features of manning, organization of composition, everyday life, combat
training in peacetime and wartime

C Organization and implementation of sanitary and hygienic measures aimed at strengthening and maintaining the health of personnel in war and peacetime

D Methods of preventive measures and preventive control used by epidemiologists in peace and wartime

E Organization of sanitary-epidemiological and bacteriological research, as well as elimination of the consequences of use
enemy of bacteriological weapons

32. Carrying out anti-epidemic measures in the company is engaged in

A Chief of the medical service of the regiment

B Battalion paramedic

C Company Sanitary Instructor

D Certified health worker

E Unit commander

33. Observation is

A Active patient identification by interviewing

B Organization of food supply for quarantined contingents

C A system of anti-epidemic and regime measures aimed at complete isolation of the epidemic and the elimination of infectious diseases

D System of isolation and restriction, preventive and special measures

E The system of sanitary and anti-epidemic measures aimed at preventing the spread of infectious diseases

34. Bacteriological intelligence is

A A complex of organizational anti-epidemic sanitary and hygienic, medical and evacuation measures aimed at preventing the spread of
infectious diseases

B A set of measures carried out by the troops of the chemical, veterinary and medical services for the timely identification of the factor, the use of bacteriological weapons

C Reconnaissance conducted by the medical service of regiments and divisions from the front line to the rear of the division

D Strengthening medical supervision in the focus of infection for the conduct of disinfection, deratization measures

E Establishing the factor of the enemy's use of bacteriological chemical weapons and weapons of mass destruction

35. A system of anti-epidemic and security measures aimed at complete isolation of the epidemic focus and elimination infectious morbidity is

A Bacteriological intelligence

B Observation

C Sanitary and epidemiological reconnaissance

D Quarantine

E Epidemic focus

36. There are zones on the quarantine site

A restricted area and high security area

B Disinfection area and deratization area

C First zone, second zone, third zone

D Zone specific and zone non-specific

E Zone of vector-borne infections, zone of airborne infections, zone of intestinal infections

37. Armed guarding of the hearth with a ban on entry and exit from it is carried out in the event of

A Conducting sanitary and epidemic reconnaissance in the outbreak

B Identification of airborne infection in the focus

C Conducting specific prophylaxis in the outbreak

D Outbreak quarantine declarations

E Conducting non-specific prophylaxis in the outbreak

38. Indicate the types of sanitary and epidemic intelligence

A Strategic, tactical, combat

B Preventive, specific

C Military, army, frontline

D Local, regional

E Epidemiological, epizootic

39. Indicate the sanitary and epidemiological state of the unit, if individual infectious diseases are registered among the personnel, have not been previously registered, or there were separate group diseases without a tendency to further spread

A Satisfactory

B Well-being

C Volatile

D Dysfunctional

E Emergency

40. The sanitary and epidemiological state of the unit, in the absence of infectious diseases and conditions for their introduction and spread among personnel, should be considered

A Satisfactory

B Safely

C Unstable

D Dysfunctional

E Emergency

41. On the basis of which document is the anti-epidemic protection of troops carried out?

A Maps of sanitary and epidemiological reconnaissance of the area

B Emergency notification of an infectious disease

C Epidemiologist's order

D Anti-epidemic plan

E Act of investigation of the causes of infectious diseases

42. What are the parts of an anti-epidemic plan?

A Description and content of the stages of the operation, data from the sanitary-epidemiological station, bacteriological intelligence

B A list of the main epidemiological measures during the preparation period and at the time of the operation

C Data on the available forces and means of epidemiological protection, reserves and the procedure for their use

D None of the above

E All of the above

43. Indicate the purpose of using bacteriological weapons

A Disinfection, disinsection, deratization of uniforms affected by pathogens of infectious diseases

B Organization of the supply of food, water supply, medicines and other types of provisions for personnel

C Training of medical instructors and disinfectants in conditions of infection by pathogens of infectious diseases

D Infections of the population, military personnel, animals and plants by pathogens of infectious diseases

E To identify the causes contributing to the occurrence of infectious diseases

44. Indicate the system of measures aimed at the advance study of the sanitary-epidemic state of the district, the location of the movement and actions of their troops, the population and the enemy troops

A military field infectious diseases hospital

B sanitary and epidemiological intelligence

C territorial hospital base

D sanitary and epidemiological laboratory

E emergency anti-epidemic commission

45. Primary sanitary losses during the use of biological weapons arise in the case of

A Contamination resulting from an operation at the time of the use of biological weapons

B Infections prior to the use of biological weapons

C Infection after the settling of biological weapons on the surface of the territory as a result of secondary aerosols (wind, dust)

D Infections during the first visit for medical care

E Infections in violation of personal hygiene rules

46. Anti-epidemic measures in the army are carried out

A Army Sanitary Epidemiological Detachment

B Sanitary instructor

C Chief Epidemiologist of the Army

D Military Field Infectious Disease Hospital

E Medical regimental station

47. Name the nature of emergencies

A Environmental

B Technogenic

C Natural

D Everything above is wrong

E All of the above is true

48. Epidemiological outbreaks of dangerous infectious diseases refer to

A Technogenic emergencies

B Local emergencies

C Natural emergencies

D Environmental emergencies

E Quarantine emergencies

49. Information about an unfavorable change in the situation in the emergency area is transmitted

A Immediately after the emergency

B No later than 2:00 am after the emergency

C No later than 8:00 from the moment of the emergency

D No later than 24 hours after the emergency

E Anytime that is convenient for those working in the emergency area

50. Particularly dangerous infections include all diseases, except

A Plague

B Typhus

C Cholera

D Yellow fever

E Ebola

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