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The textbook covers all stages of preparation of students for practical classes on life safety during the third semester, including independent and classroom work. It is structured by topics which include a list of theoretical questions and tasks for self-study. For students of medical specialties of higher educational institutions.

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TABLE OF CONTENTS

Introduction 5

Practical work № 1
Research of human biorhythms 6

Practical work № 2
Determination of the level of human sensitivity 13

Practical work № 3
Non-productive accidents 24

Practical work № 4
Assessment of the psychological qualities of the individual affecting the safety of activity 29

Practical work № 5
Quantitative risk assessment 40

Practical work № 6
Determination of human chronotype 48

Practical work № 7
Provision of first aid in case of accidents 59

Add-ons 77

Appendix 1. Questionnaire 77

Appendix 2. Non-productive accident reporting 78

Appendix 3. Non-productive accident act (NT form) 79

Appendix 4. Explanation of the act in the form of NT 81

Appendix 5. An event classifier that led to an accident 82

Appendix 6. Classifier of the cause of the accident 83

Appendix 7. Event Mission Classifier 84

Appendix 8. Accident Report 85

Appendix 9. An example of an accident investigation 86

Appendix 10. Participants in the review of the situation 87

Appendix 11. Written decision 88

Appendix 12. Non-productive accident reporting 89
Appendix 13. Written decision on the investigation 90
Appendix 14. Order # 15 91
Appendix 15. Protocol No. 1 92
Appendix 16. Conclusion on severity of injury 93
Appendix 17. Explanatory note 94
Appendix 18. Conversation minutes 95
Appendix 19. Minutes of the meeting of the commission 96
Appendix 20. Test 1 97
Appendix 21. Test 2 98
Appendix 22. Test 3 100
Appendix 23. Tasks for the calculation of individual risk 101
Appendix 24. Questionnaire I 105
Appendix 25. Questionnaire 2 106
Appendix 26. Questionnaire 3 107

INTRODUCTION

The workshop is designed in accordance with the program «Life Safety» for students of the educational qualification level «Master» of all areas of preparation and all forms of study, which in accordance with the curricula study this discipline. human biorhythms.

The workshop provides data on determining its level of sensitivity, provides information on accidents of non-productive nature, assesses the psychological qualities of the individual, affecting the safety of activity, provides a quantitative assessment of risk, signs of stress and prevention, determination of human chronotype, methods of first aid in case of accidents. Workshop for students to help students prepare for practical work that involves working on each topic individually, developing decision-making skills in each situation, and consolidating lecture material. Such a structure helps to improve the practical training of students of life safety and provides the formation of a future specialist of a comprehensive system of knowledge and skills necessary for making sound decisions in the field of human security.

PRACTICAL WORK № 1
Research of human biorhythms

The purpose of the work is to master the methodology of human biorhythms (BR) research and calculation of critical and favorable periods in individual annual cycles.

General Information

All human life, the state of its individual organs and cells are subject to the patterns of rhythmic vibrations. This is an inherited property of the body. It manifests itself over time in the alternation of intensification and attenuation of the intensity of all life processes (metabolism, development, thinking, etc.).

The chronological dependence of the condition of the organism causes rhythmic changes in the physical and mental capacity of the person. Such periods can significantly influence a person's behavior in the face of dangers; play a significant role in the occurrence of accidents, decision-making, so to increase the level of individual protection of a person against various hazards, it is necessary to have information about its biorhythms.

Instructions for implementation

1. To study general principles of the theory of biorhythms concerning physical, emotional and intellectual cycles.
2. Calculate the critical days of the physical, emotional and intellectual cycles and their phase on the day specified by the teacher.
3. Determine your level of propensity for seasonal changes in well-being and performance.
4. Set your critical periods in individual annual cycles.
5. Analyze the results of the research and provide recommendations for the prevention of negative changes in health and performance associated with biorhythmic changes in the body.

Monthly biorhythms

For many years, psychology, physiology, sports and other fields of science have been investigating monthly biorhythms (ICBMs) with a length of 23 days (physiological), 28 days (emotional) and 33 days (intellectual). At present, the theory of the three ICBMs is based on the following provisions:

Physical ICBM reflects the state of the muscular system, the ability to perform physical work and resistance to the body;

Emotional ICBM reflects the state of the neurohumoral system;

Intellectual ICBM is caused by brain activity.

These three ICBMs are described on the time axis of the sine waves. Their starting point is a person's birthday. The first half of each ICBM period is considered a positive phase, the second half is a negative phase. The days of transitioning from the positive phase to the negative and vice versa are considered critical days.

In the days corresponding to the positive part of the sinusoid, a person experiences an increase in efficiency, an improvement of the physiological state, an influx of forces, and a more emotional perception of the world. She is kind to others and appreciates them more positively. For example, athletes in the shot put have the highest number of best results (71 %) registered in the positive phase of the physical ICBM.

On critical days, there is increased fatigue, worsening of the general condition and mood. It is at this time that the greatest risk of accidents arises. Especially when the critical days of emotional and physical ICBMs coincide. For example, on critical days, the effectiveness of shooting small arms and power exercises athletes decreased respectively by 13–18 % and 6–11 %, in double critical days – by 19–23 % and 13–15 %. In the triple critical days, the results deteriorated by 29–37 %. In the critical days of a 33-day cycle, caution must be exercised when making responsible decisions.

Intra-annual and perennial biorhythms

In the endogenous annual cycle of a person, besides ICBM, there are intra-annual individual biorhythms (CBD). In other words, everyone has his or her own (endogenous) year. It does not depend on the calendar year. People with different endogenous annual cycles have biorhythmic differences in pulse fluctuations, body temperature, electrical activity of the brain, etc. Encephalograms indicate the presence of individual peaks of electrical activity of the brain with a period of 365 days. In women, another peak is detected, which occurs every 410 days.

The first annual endogenous cycle begins from the date of fertilization and ends three months after the birth of the baby.

The study of the frequency of distribution of diseases of the organism by months of individual year, deaths, personal records of athletes, etc. showed that in the endogenous annual cycle there are zones both favorable for life, and increased risk (critical periods). The first month of life after the date of birth is favorable for the manifestation of many personality traits (and first – motor abilities). The statistical analysis of the sports results of the strongest athletes in the world showed that in the first month from the date of birth personal records make 19.5 % with an average of 8.3 %.

The most vulnerable period of each year of life is the month before the date of birth. The high-risk area corresponds to the critical moments of

human embryonic development. During this period, the number of people with myocardial infarction and death from it increased dramatically.

Men in sports are characterized by a more intensive increase in results in the two years to the third, in women – in the year. The coincidence of theoretically determined periods of growth of results of athletes with actually obtained was 83 %.

The ICBM study – physical (with a period of 23 days), emotional (with a period of 28 days) and intellectual (with a period of 33 days) contains:

– Determination of the date of critical days for each of them;

– Calculation of the ICBM phase, which falls on the selected day. A critical day is the date corresponding to the full ICBM period under study from the date of birth. The cycle phase corresponds to the remainder of dividing the number of days spent by the length of the period.

Work should be performed in the following order:

a) Calculate the number of full years lived by the formula:

$$H = (B–C) –1, \quad (1.1)$$

Where N is the number of full years lived; B – year at the time of ICBM study; C – year of birth.

b) Set the number of leap years among fully lived years (Table 1). High is considered years that divide by four, except for the years ending in two zeros and not divisible by 400.

c) Set the number of days lived in the year of birth and in the current year by the set date.

d) Calculate the total number of days spent by the formula:

$$D = [365 \bullet (H–L)] + (366L) + R + T, \quad (1.2)$$

Where D is the total number of days spent; H – number of full years lived; L – number of leap years; R – number of days lived in the year of birth; T is the number of days spent in the current year up to a given date.

e) Calculate the proportion (N1 ... 3) of dividing the total number of days spent by the ICBM period.

The whole number of the obtained share corresponds to the number of complete periods of the studied ICBM, the remainder to the number of days from the beginning of the last period to the set date. Therefore, the first critical day of a given date can be found by adding to that date the difference of days between the ICBM period and the remainder. The following critical days can be calculated by adding the studied ICBM period to the found date.

e) set the dates of the first and next critical days for the ICBM under study.

It should be remembered that due to the drift of the ICBM, which is caused by age and the impact of stressors, as well as rounding in the calculations, the date of the critical days could not be determined exactly.

Differences can be several days. In this regard, life-threatening days may also be dangerous. Therefore, it is advisable not to set a separate critical date but an area of increased risk of life that covers both the previous critical day and the next.

g) Determine the ICBM phase. It will correspond to the balance obtained when calculating the number of complete periods of the studied ICBM.

g) Record the results as a table.

Table 1

Leap years from 1956 to 2012 and number of days in months of the year

Leap years			Month	Number of days	Month	Number days
1956	1976	1996	January	31	July	31
1960	1980	2000	February	28 (29)	August	31
1964	1984	2004	March	31	September	30
1968	1988	2008	April	30	October	31
1972	1992	2012	May	31	November	30
			June	30	December	31

Example 1.

Your birthday is January 29, 1980. You are investigating all your ICBMs on November 11, 2001.

Calculate by the formula (1.1) the number of years you have lived full.

$$H = (2001–1980)–1 = 20 \text{ (years)}$$

Set for table 1 the number of leap years in the number of fully lived. Their number is six.

Let us determine the number of days spent in the year of birth. You were born on January 29, that is, in your birth year:

$$R = 3 + 29 + (6 * 31) + (4 * 30) = 338 \text{ (days)}$$

Let us determine the number of days spent in the current year up to a given date. You are researching the ICBM on November 11, 2001. At this time, you have spent six months on 31 days, three months on 30 days and one month lasting 28 days, as well as 11 days before the set date. Therefore, the number of days spent in the current year up to a given date is equal to:

$$T = (6 • 31) + (3 • 30) + (1 • 28) + 11 = 315 \text{ (days)}$$

Calculate the total number of days spent by the formula (1.2).

$$D = [365 + (20–6)] + (366 * 6) + 338 + 315 = 7959 \text{ (days)}$$

We calculate the fraction by dividing the total number of days spent by the ICBM period, and set the first critical days after a given date.

For physical ICBMs: N1 = 7959/23 = 346.04 = 346.0. For emotional ICBM: N2 = 7959/28 = 284.30 = 284.3. For Intelligent ICBMs:

$$N3 = 7959/33 = 241.18 = 241.2.$$

Thus, 346 complete periods of physical, 284 emotional, and 241 intellectual cycles were completed during the study (November 11, 2001). Therefore, the balance for the physical ICBM is (23 • 0) = 0 days, emotional – (28 • zero, 3) = 8 days, intellectual – (33 • zero, 2) = 7 days. The critical day for the physical ICBM will come in (23 – 0) = 23 days, the emotional one – (28 – 8) = 20 days, intellectual (33 – 7) = 26 days. It will correspond to the following dates: for the physical ICBM, the first critical day after the given date will be (November 11 + 23 days) December 4, emotional – (November 11 + 20 days) December 1, intellectual – (November 11 + 26 days) December 7.

Determine the ICBM phase. For the physical ICBM on November 11, 2001 there will be a zero day of the cycle, for the emotional ICBM the 8th day of the cycle, and the intellectual one – the 7th day of the cycle. This corresponds to the critical day of the physical and positive phases of the emotional and intellectual ICBM.

Record the results of the study according to table. 2.

Table 2

Results of the study of monthly biorhythms

The ICBM under study	Date research	Date birth	Number survivors days	Number of complete ICBM periods	Balance, days	Date critical day	ICBM phase
1	2	3	4	5	6	7	8
Phys.			7959	346	0 8	4/12/01	Critical
Emotions.	11.11.01	01/29/80	7959	284	0.3	1/12/01	Positive
Intell.			7959	241	0.2	7/12/01	Positive

Task 2. Determination of susceptibility to seasonal depression

Work should be carried out in the following order.

1. Examine the questionnaire and write the number of vital activity index and scores corresponding to its changes by seasons in the workbook.

2. Determine the level of difficulty caused by these changes. To do this, select from the words «no», «small», «noticeable», «disable» (Table 4).

3. Calculate the amount of points that evaluate your performance.

4. Compare them with the values in Table 3, set the level of seasonal affective disorder (SAR).

5. Record the results in Table. 5.

Table 3

Questionnaire to determine individual susceptibility to seasonal depression

№ p / n	Activity indicator	Bali		
		not is changing	changes slightly	greatly change-yay
1	Duration of sleep	0 0 0 0 0 0 0	1	2
2	Sociability		1	2
3	Mood		1	2
4	Well-being		1	2
5	Activity		1	2
6	Weight		1	2
7	Appetite		1	2

Table 4

Estimation of Seasonal Affective Disorder (SAR)

№ p / n	Sum of points	The level of difficulty that is caused by the seasons of the year	0CAP level
1	0	None	Absence of CAP
2	1–8	Notable or disabling	Low
3	9–10	Notable or disabling	The SAR sub syndrome
4	11and more	The lack of noticeable difficulties	The SAR sub syndrome
5	11 or more	Notable or disabling	High levels of CAP

Table 5

Results of determination of individual propensity to seasonal depression

Sum of points	The level of difficulty that is caused by the seasons of the year	The level of SAR

Task 3. Establishing critical and favorable periods in individual annual cycles

Materials: calendar.

The tasks are performed in the following order

1. Using the calendar, determine which period of the calendar year corresponds to the twelfth month of the «individual» year. This period is critical for your life, in which you need to be especially attentive to your health, mode of work and rest. This is your «risk zone».

2. Similarly, determine which period of the calendar year corresponds to the first month of your «individual» year. This period will be the most favorable for you, which is marked by the increase of mental and physical abilities. This is your «star time».

3. Set the calendar year dates corresponding to the ninth, tenth, and eleventh months of the «individual» year. These are also favorable areas of your annual cycle.

4. Record the results in Table. 6. At the same time, keep in mind the relativity of the set dates, as the «risk zone» may not cover the entire twelfth month.

Table 6

Results of establishment of critical and favorable periods in individual annual cycles

№ p / n	Month of the calendar year, which corresponds to the «individual» year of the period / month					Conclusion
	critical period	«Vision-time»	auspicious period			
	On the 12th	1st	On the 9th	On the 10th	On the 11th	
						The critical period from to ____ (give) «3 Star Time» from to _____ (give). Auspicious period from _____ to _____ (give)

Example

Your birthday is March 20. Identify your critical and favorable times. The critical period is the month before the date of birth. So, for you, it runs from February 20 to March 20. 3 March 21 to April 20 is the most favorable period of your annual cycle.

Structure of the practical report

- Report structure:
- Purpose and tasks;
- Output data,
- The order of performance of work;
- Results of the RESEARCHES;
- Conclusion.

Control questions

1. Discover the basic principles of the theory of lunar biorhythms.
2. How do different periods of monthly biorhythms affect a person's life?
3. What days of lunar biorhythms are considered critical?
4. How can monthly biorhythms be used in production and in everyday life?
5. What are seasonal biorhythms, give examples.
6. What is the difference between «biological», «individual» and calendar years?
7. What is the critical period of the endogenous year?
8. What is the role of the endogenous critical year in human life?
9. When is the occurrence of seasonal affective disorder (cap) most likely?
10. What types of perennial biorhythms do you know about?

PRACTICAL WORK № 2
Determination of the level of human hypersensitivity

The goal of the work

Learn how to determine the level of impact of weather conditions on human performance and learn about measures and means of preventing meteotropic reactions.

Methodical instructions

1. To study general information about the dependence of the state of health and performance of a person on weather and meteorological factors.
2. Assess the degree of readiness for practical tasks by answering self-test questions. Collective discussion under the guidance of the teacher is possible.
3. To determine the level of pathogenicity of the weather and its irritant effect, to evaluate the complex influence of weather and meteorological factors on the human body .
4. Provide an estimate of your own weather dependence.
5. Analyze the results of the study and provide recommendations for the prevention of meteotropic reactions.
6. Make a report .

Dependence of the state of health and performance of the person on weather and meteorological factors

Weather concepts, meteorological factors, indicators and methods for assessing the level of pathogenic effects

Weather is the physical state of the atmosphere that occurs under the influence of solar radiation and the circulation processes in the atmosphere, as well as the underlying surface. Weather is a holistic formation of nature, a complex interaction of weather and meteorological factors.

Weather and meteorological factors include air temperature, atmospheric pressure, air humidity, cloudiness, precipitation, wind, as well as the electrical state of the atmosphere. A special place is occupied by changes in the Earth's electromagnetic field – magnetic storms.

In addition, an important role in the formation of weather is played by the processes of circulation in the atmosphere, which arise from the difference in temperatures of the Earth's surface at different latitudes, as well as between continents and oceans. The difference in temperatures in the high and low layers of the troposphere, as well as the Earth's rotation, which deflects air currents, reflects and matters.

Air flows as they move interact with each other. The boundaries of the distribution of air masses, where there are particularly pronounced changes in weather factors, are called fronts. There are arctic, polar and tropical

fronts. There are also cold, warm and occlusion fronts. The occlusion front is a complex front that is formed by closing the cold and warm fronts.

Frontal activity is associated with sharp inter-day non-periodic temperature variability, dominated by cloudy and rainy days. This changes the electrical properties of the atmosphere. The low pressure front is called a cyclone. High pressure zone – anticyclone. All these weather phenomena can cause dramatic changes in the human body.

The nature of the impact on the person of the weather is classified by the reactions to weather and meteorological factors that occur in the body. Depending on the favorable or unfavorable effects on the human body, the weather is distinguished from zero point (absolutely comfortable weather) to five-point (extremely uncomfortable).

A comfortable type of weather is from 4 to 36 %, and unfavorable – from 32 to 48 % of the number of days a year.

Now the relationship between fluctuations of weather conditions and occurrence of adverse reactions of an organism till serious illnesses and death, influence of weather on mental and physical capacity is proved.

The adverse effect of weather on the human body is evaluated on the basis of such indicators.

The level of pathogenic effect of the weather, that is, such an action that causes a violation of the normal human condition is established on the basis of the general index of pathogenicity of the weather. It is defined as the sum of components of pathogenicity indices by individual indicators:

$$J = i_i + i_h + i_v + i_{\Delta p} + i_{\Delta t}, \quad (3.1)$$

where J is the total pathogenicity index; i_{i} – index of pathogenicity of air temperature ; and $_h$ – humidity pathogenicity index; and $_v$ is the wind speed pathogenicity index; $i_{\Delta p}$ *is* the pathogenicity index of change in atmospheric pressure, and $_{\Delta t}$ *is* the pathogenicity index of change in air temperature.

The constituent pathogenicity indices are calculated by the following formulas.

Pathogenicity index of air temperature (i_i) :

$$i_i = 0.2\,(18–t)^2 \quad \text{at } t \le 18\ ^\circ\text{C}, \quad (3.2)$$

$$i_i = 0.2\,(t–18)^2 \quad \text{at } t \ge 18\ ^\circ\text{C}, \quad (3.3)$$

where t is the average daily air temperature, °C.

Wind speed pathogenicity index (i_v) :

and $$v = 0.2 \cdot v^2, \quad (3.4)$$

where v is the average daily wind speed in m / s.

Pathogenicity index of change in atmospheric pressure:

and $$\Delta p = 0.06 \cdot (\Delta p)^2, \quad (3.5)$$

where Δp is the daily change in the average daily atmospheric pressure in mm Hg. century / d.

Pathogenicity index of air temperature change:

and $$\Delta t = 0.3 \cdot (\Delta t)^2, \quad (3.6)$$

where Δt is the daily change in average daily air temperature in°C / day.

Classify the pathogenic effect of the weather on a scale (Table 3.1).

Table 3.1

Assessment of the pathogenicity of the weather

The value of J	Assessment of pathogenicity of weather
0–9	Optimal
10–24	Irritating
25 and more	Sharp

The degree weather irritating action set to the ratio tion:

$$R = 0.6 \cdot J \quad (3.7)$$

where R *is the* degree of irritant effect of the weather;

J *is the* total pathogenicity index.

To evaluate the complex effect of weather and meteorological factors on the human body use the coefficient of rigidity of the weather (S).

Weather stiffness factor is calculated by the formula:

$$S = (1–0.006 \cdot t) \cdot (1 + 0.272 \cdot v) \cdot Kv \cdot Ka, \quad (3.8)$$

where S *is the* stiffness of weather, points;

t *is the* average daily air temperature,°C ;

Kv – relative humidity coefficient equal to 0.9 for humidity less than 60 %; 0.95 for 61–70 %; 1.0 – to 71–80 %, 1.05 – to 81–90 % , and 1.1 – for humidity pain shoyi than 90 %;

Ka – coefficient taking into account the role of daily variability of air temperature; it is: in the case of variability up to 4°C – 0,85, from (4,1°C to 6°C) – 0,90, from (6,1°C to 8°C) – 0,95, from (8.1°C to 10°C) – 1.00, from (10.1°C to 12°C) – 1.05, from (12.1°C to 14°C) – 1.1, from (14,1°C to 16°C) – 1,15, from (16,1°C – 18°C) – 1,20, more than 18°C – 1,25;

v – average daily wind speed, m / s.

The higher the value of the weathering coefficient S, the greater the disturbance of the physiological systems of the organism, the stronger the influence of weather and meteorological factors on the human body.

Tables and 3.2 give a classification of weather conditions according to the stiffness factor.

Table 3.2

Weather stiffness assessment

The cruelty of the weather	Periods of the year	
	Winter and transition periods	Summer
Soft	0 to 1.0	0 to 1.0
Moderately stiff	From 1.1 to 2.0	0 to 0.4
Hard	From 2.1 to 4.0	From – 0.41 to – 0.8
Very tough	4.1 or more	–0.81 less

Influence of weather and meteorological factors on the condition and performance of the person

The modern perception of the effect of weather on the human body is based on the principles of unity of the organism and the environment. Human responses to the effects of weather and meteorological factors are considered as part of the general problem of interaction between the environment and the body. They reflect natural periodic processes. In other words, they are manifestations of the coherence of human biological rhythms with changes in natural factors. This weather caused by external cause – exogenous reactions. They are called exogenous biorhythms, that is, dependent on the external environment, as opposed to the biorhythms generated by the body itself. These are endogenous biorhythms. They arise as a result of the processes of self-regulation of biological systems.

The basis of human action on weather and meteorological factors are reflex reactions to thermal, mechanical and osmotic stimuli. The degree of response to weather changes depends on the nature and strength of the irritant, the state of the central nervous system and, above all, the activity of the right hemisphere of the brain. The main «targets» of the influence of weather and meteorological factors on the body are: skin and mucous membranes bordering on the external environment; upper respiratory tract and lungs; analyzer system.

In case of considerable intensity of the irritation the muscles and internal organs can irritate.

The main meteorological causes contributing to the development of negative reactions of the body are:

– rapid and contrasting change in weather and weather factors;
– fronts, cyclone or anticyclone formation;
– changes in heliophysical factors (perturbation in the sun, changes in atmospheric electricity, etc.)

People respond differently to changing weather conditions. A healthy organism rebuilds its internal processes in a timely manner in accordance with other environmental conditions due to the reserve capacity. All homeostatic systems are activated: immune protection is enhanced, metabolic processes are improved; accordingly, nervous reactions and the endocrine system are rebuilt;

maintains or even improves performance. Subjectively, all these phenomena are perceived by a healthy person as a feeling of well-being, mood enhancement. There may be some euphoria, generosity, reassessment of one's capabilities.

A completely different reaction to changes in weather factors in depleted people, with diminished adaptive reserves. This group includes overworked, weak and sick people. On days characterized by changes in one or more of these factors, they worsen the state of energy, immune defense, cardiovascular, digestive, excretory systems, respiratory organs, slow the reactions of the central nervous system, reduce performance. The body begins to lose the ability to quickly adapt its internal reactions to new environmental conditions, which manifests itself in the deterioration of well-being, headache, shortness of breath, hypertensive crises and other negative reactions.

According to the results of psychophysiological researches in the period of gravitational disturbances it was found that critical situations lead to the appearance of psycho-emotional stress in 89,4 % of overworked and with different variations in the state of human health. In these people, the rate of reaction to the change of situation decreases from the norm by 6–7 %. In healthy people on critical days, the rate of reaction to other circumstances increases by 3–8 %, but at the same time increases by 5–9 % the number of errors. Subjectively healthy people on critical days often undergo mood improvements, overestimate their capabilities.

The study of mental performance of healthy people in different types of weather showed the influence of weather and meteorological factors on the processes of thinking, short-term memory, latent period of visual-motor reactions, psycho-emotional state. Performance indicators of mental activity correlate with changes in weather and meteorological factors and change according to the characteristics of higher nervous activity of the individual.

In people with high levels of neuroticism in adverse weather, the processes of thinking and short-term visual memory improve, the prevalence of anxious and depressed states is observed, and attention is reduced. The number of false reactions in persons with low neuroticism is independent of weather and meteorological conditions.

Overworked people in times of crisis weather are shifting towards negative emotions: a feeling of anxiety, sharply deteriorating mood, insomnia, a state of discomfort, mental tension, dissatisfaction, increased irritability, which leads to unreasonable conflict. Fear of imaginary dangers may arise. People begin to exaggerate difficulties, find themselves prone to affective and hysteroid reactions, increased aggression, or, conversely, try to avoid social contact.

Objectively, such people are reduced by 10–15 % performance indicators, by 5–10 % – endurance indicators, inhibitory processes in nervous activity increase. This causes 88 % of injuries.

The results of biochemical studies indicate that weather effects are reflected not only on the psychophysiological state of man. In critical days deteriorate the metabolism of lipids, enhance their peroxidation, deteriorate the metabolism of toxic products, decrease liver function, significantly reduce cellular immunity, increase the content of insulin in the blood, sharply increases the concentration of g. On the basis of this, scientists have come to the conclusion that under the influence of negative weather and meteorological factors on an organism that is in a state of depletion of adaptive reserves, it can lead to destabilization of homeostasis, neuro-psychiatric, somatic and vegetative functions, reducing the coordination of performance. These changes, on the one hand, reflect the influence of weather factors, on the other – depend on the characteristics and type of personality. Subjectively and objectively, the reactions to the weather conditions are quite diverse, they are determined by the state of the organism, age, type of nervous system and other endogenous and exogenous factors.

One of the most common is the body's reaction to raising or lowering atmospheric pressure.

In the case of a sharp increase in atmospheric pressure, a difference between the pressure in the internal cavities of the body and the pressure of the surrounding air arises. It manifests as a pain in the heart and other organs, the head, blood pressure increases, vascular crises are possible.

In the event of a decrease in atmospheric pressure, the gases present in the gastrointestinal tract expand and cause the organs to stretch. This is accompanied by impaired appetite and impaired digestion. In addition, high diaphragm levels can cause breathing difficulties and impaired cardiovascular function.

Various fluctuations in temperature and humidity can cause not only different thermal perception, but also fluctuations in heart rate, changes in body temperature, weight and more. Some people who are sensitive to the weather get pale in the rain. Increased humidity can be accompanied by headache, drowsiness, poor mood, limb pain, etc.

Increases in temperature, humidity and atmospheric pressure are accompanied by a sharp decrease in the amount of oxygen in the ambient air. Such circumstances can cause hypertensive crises and strokes.

Thus, weather and meteorological factors create additional stress for humans, with the body responding to maintain homeostasis at a certain level. Meteotropic reactions are meteor neurosis of maladaptation.

Human sensitivity and method of its determination

Weather and meteorological factors affect the body not by individual elements, but by the totality of their properties, their action is not total but integrated.

The main reasons contributing to the occurrence of various reactions of the body to changing weather conditions are human susceptibility to weather stimuli, or weather sensitivity.

Weather sensitivity is a normal and at the same time physiological property that is essential for the body to harmonize its life with the rhythms of the biosphere. Responding the human body to changing weather and meteorological factors is a normal physiological response. It aims to improve living matter, to maintain harmony with a constantly updated world.

Pathological response of the organism to weather changes should be distinguished from physiological sensitivity. A pathological response is called «meteotropy» or «meteopathy.» It can be hereditary (passed on from parents to children), and can occur as a result of major fatigue, illness, in stressful situations where the adaptive reserves of major life support systems do not have time to prepare the body for extreme weather situations. Such disharmony with nature with each new outbreak of weather changes can increase and become one of the main mechanisms of formation of chronic pathology.

Meteopaticheskih response body felt subjectively and objectively manifested in poor health, headaches, insomnia, increased or decreased blood pressure, spasm max coronary and cerebral vessels in mental discomfort, worsening metabolic, immunological and other processes.

Meteopathic reactions can be grouped into the following main groups:

1) rheumatoid – manifested by muscle pain, general fatigue, inflammatory phenomena in the peripheral nerves, etc.;

2) cardiac – manifest in the form of pain in the area of the heart, heart rhythm disorders, etc.

3) catarrhal – manifested in disorders of the gastrointestinal tract;

4) cerebral – characterized by increased irritability, general arousal, insomnia, headache, blood flow to the head, nasal bleeding, respiratory disorders, negative psycho-emotional states, etc.

Meteotropic reactions are most often observed in sick people. But about 40 % of the healthy population also feel their well-being dependent on changing weather and weather factors. 20 % of them depend on this dependence from their close relatives, which may indicate a hereditary mechanism of weather sensitivity. In addition, citizens are 1.5–2 times more sensitive than rural residents. This is due to the fact that citizens are less adapted to fluctuations in the speed of movement and air temperature, humidity and other weather factors.

The degree of manifestation of meteopathic reactions and B. V. Bogutsky is divided into three groups:

1. Weakly expressed reactions, characterized mainly by subjective symptoms without the phenomena of intoxication;

2. Moderate reactions: the phenomena of intoxication are joined to the objective symptoms, the fever is increased within 3–5 days;

3. Strongly expressed reactions, which are manifested in hypertensive crises, angina attacks, asthmaid states, etc.

Recommendations for the prevention of meteotropic reactions

Central nervous system plays an important role in the development of meteotropic reactions. Meteotropic reactions are more commonly observed in individuals with impaired excitation and inhibition in the cerebral cortex or with the predominance of the excitation process. In addition, it was found that the most complete adaptation of a person to the action of weather factors occurs at a higher functional activity of the right hemisphere of the brain. This hemisphere is responsible for the formation of emotions. It dominates the control of aggressive behavior.

It is on understanding the role of the right hemisphere of the brain in the development of adaptive responses to changing weather conditions that a number of tips for the prevention of meteotropic reactions, primarily in the psycho-emotional sphere, are based.

It is recommended that in the run-up to the forecast adverse weather, you should engage in any kind of creativity, drawing better, reflecting bright colors on a sunny morning, flowers, forest, etc. The picture should have as many joyful tones as possible. It doesn't matter if this painting is not an artistic masterpiece.

The same effect on the function of the right hemisphere of the brain as ma wording of, walking invented by Professor A. P. Churikov and co-workers have pink glasses. They are called FILAT glasses. They combine the use of bright lighting and filters with certain physical characteristics. With these glasses it is possible to improve the mood, increase the pace of thinking, calm down, and regulate sleep disorders. Their use by meteorological addicts had a positive effect in 80 % of patients.

Thus, the most important during critical weather conditions is the removal of emotional stress. It can prevent hypertensive crises, angina pectoris, reduce the risk of strokes, and reduce the number of suicides.

Along with the above it is possible to apply the methods of psycho-emotional unloading: autogenic training and meditation.

For many, light therapy may be helpful. Its action is to activate the brain with bright white or dim red light. This method was suggested by experts at the National Institute of Mental Health of the United States. The best effect this method causes in people who tend to eat a lot of carbohydrate food in the afternoon. Because of this, it is advisable not to spare the light when working on cloudy days and at night. Light can be replaced by the use of the drug melatonin or vitamin B_{12}. However, the use of these agents is dangerous because it can disrupt the daily biorhythm of the person.

Another preventive measure is nutrition. Me-sensitive people are advised to supplement the diet with foods rich in antioxidants (antioxidants), substances that inhibit the oxidation of fats. Natural antioxidants include fresh oils, cheese,

black-berry rowan, sprouted oats, fresh vegetables and more. At the same time, you should remove fried foods and alcohol from your diet. In addition, it is recommended to replace the diet with protein-fat type, and on dangerous days, it is necessary to significantly reduce the caloric intake.

Treatment with a complex of drugs having antioxidant properties may be attributed to the same group of preventive agents. After one month of treatment, 80 % of patients have no meteotropic reactions within six months.

Progress of work performance

Objective 1 . To determine the level of pathogenicity of the weather and its irritant effect, to evaluate the complex influence of weather and meteorological factors on the human body.

Work should be performed in the following order.

1. Record in table. 4.2 weather and meteorological factors, which are given in the table in Appendix 4.1.

2. Calculate the average daily temperature, humidity, wind speed, atmospheric pressure.

3. Calculate the value of the daily change in atmospheric pressure and temperature.

4. Calculate according to formulas (4.2–4.7) the constituent indices of pathogenicity of temperature, humidity, wind speed, changes in atmospheric pressure and changes in temperature.

5. To calculate on the basis of components of pathogenicity indices the general index of pathogenicity of weather.

Table 3.2

Weather and meteorological factors

Name of factor	**The value of the factor**								**The day-to-day is different**
	For the previous day			Daily average	For one day experiment			Daily average	
	Measurements				Measurements				
	1	2	3		1	2	3		
Temperature, °C									
Wind speed, m / s									
Atmospheric pressure, mmHg									
Air humidity, %									

6. To perform, on the basis of values of the general pathogenicity index, an assessment of the pathogenic effect of weather on the human body on a scale (Table 3.1**).**

7. Determine by the formula (3.8) the degree of irritant effect of the weather.

8. Calculate by the formula (3.9) the coefficient of rigidity of the weather and evaluate the complex effect of weather and meteorological factors on the human body.

Task 2. To give an estimate of own meteorological dependence.

Perform the work in the following order:

– fill in the form. Answer «yes» or «no» to each question;

– count the number of points that correspond to «yes». Conclude meteorological dependence on the basis of comparative table 3.4.

The calculation of the sum of points allows to get a subjective assessment of one's own meteorological dependence, to conclude that it is necessary to apply measures to reduce meteorological dependence.

Questionnaire

	Bali
1. Do you experience differences in different seasons (yes / no) in:	
a) well-being,	20
b) moods;	5
c) working capacity;	10
d) health	20
2. Do you notice any changes in (yes / no) weather:	
a) well-being	20
b) working capacity	10
c) mood	5
3. What is the subjective (yes / no) influence of bad weather:	
a) weaknesses;	10
b) drowsiness;	5
c) bad mood;	5
d) headache;	15
e) dizziness;	25
e) other ailments	20
4. What weather has the greatest impact on you (yes / no):	
a) rain;	10
b) windy;	10
c) frying;	10
e) cold;	10
f) dry;	10
g) with high humidity	10
5. Do you feel any future changes in the weather: (no need to cross out)	
a) yes	20
b) no	0

Table 3.4

Comparative Table of Weather Dependencies

Total points	**Level of weather dependence**
0–25	Resistant
26–50	Low
51–100	Threshold
101–150	High
Over 151	Extremely tall

Report

The report should include:

– job title;
– purpose;
– materials and equipment used;
– results of the conducted determinations;
– conclusions.

Control questions

1. What is meant by the term « weather and meteorological factors»?
2. Why are the weather changing?
3. What are the types of weather?
4. What indicators are used to quantify the adverse effects of weather on the human body?
5. What are the reactions of the human body to weather changes?
6. How does the weather affect mental and physical performance?
7. What is weather sensitivity?
8. How is meteorological sensitivity different from meteopathic reactions?
9. What is the method of determining a person's hypersensitivity?
10. What are the main directions of prevention of meteotropic reactions?

PRACTICAL WORK № 3
Non-productive accidents

Purpose and tasks of practical work

The purpose of the practical work is to get acquainted with the normative document «Procedure of investigation and accounting of non-productive accidents».

Objective: To investigate and report a non-productive accident in accordance with the regulatory document on the basis of initial data.

Initial data

Students under the guidance of the teacher consider a specific situation.

General information

«Procedure of investigation and accounting of non-productive accidents» defines the mechanism of investigation and record of non-production accidents that have occurred with citizens of Ukraine, foreigners and stateless persons in the territory of Ukraine.

Investigation under this document is subject to unhappiness

– commuting to or from work on foot, on a public, own or other means of transport, not belonging to an enterprise, institution or organization (hereinafter referred to as organization and not occurring during: used for the benefit of these organizations;

– movement by air, rail, sea, inland waterway, road transport, in electric transport, subway, on cable car, cable car of vehicles; and other species.

– performing public duties (rescuing people, protecting property, law enforcement, etc.) if they do not belong to their official duties;

– performing donor functions;

– participation in public actions (rallies, demonstrations, propaganda activities, etc.);

– participation in cultural events, sports competitions,

– conducting cultural, sports and wellness events related to the educational process in educational institutions;

– use of gas in the home

– committing unlawful acts against a person, his property;

– use or contact with weapons, ammunition and explosive materials;

– execution of works in the household, use of household appliances;

– natural disasters;

– stay in public places, at trade and household facilities, in health-improving, cultural, educational and sports-entertainment establishments, in other organizations.

The fact of an accident due to an accident establishes and certifies a health care facility.

A document that confirms a person's health is an incapacity for work or a certificate of treatment .

Accidents are investigated regardless of whether the victim was intoxicated or intoxicated .

Accident reports . Medical and medical establishments, to which the victims were contacted or delivered in the aftermath of the accident, shall send a written notification within the prescribed time period (Appendix 2):

– about a fatal accident, as well as a group accident that occurred simultaneously with two or more persons, – to the district state administration (executive body of city, district in the city council):

– a fatal accident related to bodily injury by another person, and an accident resulting from contact with weapons, ammunition and explosive materials, or during a road traffic accident, to the law enforcement agencies.

Fatal accidents are also sent to prosecutors.

Accident Investigation.

Accident investigations are conducted to determine their circumstances and causes. Based on the results of the investigation, measures are being taken to prevent such cases and to address the issues of social protection for the victims.

The investigation shall take into account the incapacity for work or information of the health care facility, as well as the explanation of the victim and the testimony of eyewitnesses.

Investigation of fatal accidents, group accidents in the case of the death of at least one of the victims, accidents related to personal injury by another person, as well as accidents resulting from contact with weapons, ammunition and explosions law enforcement agencies or prosecutors.

The district state administration (executive body of city, district in city council) within a day from the date of receipt from the medical-preventive institution of the notification of an accident (except for accidents with fatal consequences), decides on the establishment of a commission to investigate an accident.

The commission may involve representatives of the organization where the victims work or study, the organization in the territory or object of which the accident occurred, as well as representatives of the health, education, consumer protection, insurance company experts (if the victim was insured)).

Investigations into accidents occurring on the way to or from work are brought in by representatives of the relevant trade union body or by the staff of the labor collective if the victim is not a member of the union.

In case of an appeal to the victim or the person of his interest (if no notification was received from the medical-preventive institution about the accident), the district state administration (executive body of city, district council in the city) decides on the need to conduct an investigation and

determine the organization that should to investigate, send a copy of the decision to the manager.

The head of the organization shall appoint a committee consisting of not less than three persons from the day of receipt of the decision authorizing him to conduct the investigation.

Accidents (other than group accidents) that occur to employees are investigated by a commission formed by the organization where the victim works, with the head of the commission – an official designated by the head of the organization , and a member of the commission – the head of the relevant structural unit, a representative of the trade union organization , a member of which is from the victim , or an authorized labor collective if the victim is not a member of the union.

Decisions to investigate an accident are made by the head of the organization on the basis of a victim's complaint, a letter of incapacity for work or a certificate of a medical-preventive institution.

In case of failure of the organization to investigate the unfortunate case of a victim or a person representing his interests, may apply to the district derzhadmi nistratsiyi (executive body E tion, the district council in the city), which decides whether to conduct this investigation.

An accident investigation is conducted within 10 calendar days after the commission is formed. If necessary, this term may be extended by the head of the body (organization) that appointed the investigation.

According to the results of the accident investigation, an act in the form of NT (non-industrial injury) is drawn up in accordance with Add. 3, which is approved by the head of the body (organization) that conducted the investigation.

An explanation of the completion of the NT act on a non-productive accident is given in annex. 4.

The required number of copies of the act is determined in each case.

An act in the form of NT shall be sent to:

– the victim or the person representing his interests;

– the district state administration (the executive body of the district council in the city);

– organizations where the victim works or studies ;

– the organization responsible for the safe condition of the area or facility where the accident occurred.

– a copy of the act is sent to the law enforcement agencies, prosecutors and other organizations upon request.

During the investigation of a group accident, an act in the form of a NT is drawn up for each victim separately.

For the drafting of the act in the form of NT use the event classifiers that led to the accident (appendix 5), the causes of the accident (appendix 6), the scene (appendix 7).

Acts in the form of NTs, which constitute the results of an accident investigation with employees, are stored in the organization together with the investigation materials for 45 years. Acts in the form of NT and materials of investigation of accidents with non-working persons are stored for three years in the archive of the district state administration (executive bodies of city, district councils in cities).

The registration of accidents, according to the results of the investigation of which acts under the form of NT are drawn up, will be carried out by district state administrations (executive bodies of city, district councils in cities) and organizations that conducted the investigation.

The organization responsible for the safe functioning of the population in the area or facility where the accident occurred shall take the measures proposed by the investigating commission to remedy the causes of such incidents. The head of the organization informs the district state administration (executive body of city, rayon council in the city) about the implementation of these measures within the period specified in the act in the form of NT.

Accident accounting and analysis.

Accidents and forms of NT are used to classify the causes of their occurrence and are conducted by district state administrations (executive bodies of city, district councils in cities) on the basis of reports on accidents according to the established form (Appendix 8), which are sent monthly by treatment and preventive institutions.

Summarized report on accidents and incidents of district state administrations (executive bodies of city, rayon in city councils) are sent to the Council of Ministers of the Autonomous Republic of Crimea, oblast, Kyiv and Sevastopol city state administrations quarterly by the 15th of the month, which comes in the reporting period, by 31 January of the following reporting year.

The Council of Ministers of the Autonomous Republic of Crimea, oblast, Kyiv and Sevastopol city state administrations analyzes the reports received, summarizes them and submits them to the State Inspectorate of Health, respectively , by the 25th of the following month for the reporting quarter and by February 10 next for the reporting year.

The procedure for calculating non-productive accidents

The payment of the payment to the victim is carried out by the accounting department of the enterprise where the victim works, in the presence of an act of accident in the form of NT and a medical certificate.

The calculation of the amount of payment to the victim is made taking into account the average monthly earnings. If the victim has worked for less than 12 calendar months, the average monthly salary is determined by

dividing the total amount by calendar months of work by the number of those months. If the victim has worked for less than one calendar month, the earnings for all worked time are divided by the number of days worked and the amount received is multiplied by the number of working days per month, calculated on average per year (25.4 – for a six-day working week and 21 , 2 per year – for a five-day working week). Total payments consist of an accrued amount, excluding earnings for the first 5 days.

In the event that an accident occurs on the way to and from work, the amount of payment is calculated from the first day of the injury.

Control questions

1. What accidents are to be investigated?
2. Who investigates fatal or gun-related accidents?
3. Who makes the decision to set up an accident investigation commission?
4. After what time does the manager, having received the decision on the necessity of the investigation, and in what composition appoints the commission?
5. What document confirms the health of the victim?
6. What document is drawn up as a result of an accident investigation?
7. What is the deadline for the commission to investigate an accident?
8. What is the term of the NT acts?
9. Who implements the measures proposed by the Accident Investigation Commission?
10. Who analyzes the causes of accidents?

Report

1. Specify the purpose of the practical work.
2. According to the variant of the task to investigate an accident, for which:

– to make a written notice from the health care institution;

– to make a written decision of the district state administration on the establishment of a commission for investigation of an accident, and the company that will investigate this accident; – to make a commission for investigation of an accident; – to draw up an act in the form of NT (*Appendix 8*).

3. Add up the order of payment calculation.
4. To calculate the amount of compensation for the accident. The practice report includes:

1) General theoretical provisions for the investigation of non-productive accidents are summarized.

2) Documents according to item 2. report, including the Act in the form of NT, made on the example of a business game situation.

PRACTICAL WORK № 4
Assessment of the psychological qualities of the individual affecting the safety of activity the goal of the work

Identify individual psychological qualities that determine the psychological security of the individual in the face of physical danger, identify differences in these qualities for groups of people involved in testing.

General theoretical information

Human ability to withstand danger in the process of activity is determined by complex interactions of various factors:

а) purely biological factor arising from natural human rights;
б) features of the human psyche;
в) professional experience, skills, abilities;
г) motives, interests, attitudes of the person.

Motives of activity

The activity is aroused by the needs that arise in the human body, that is, something that lies outside and necessary for the functioning of the body. If knowing the needs of a person makes it possible to understand why he or she is acting, then determining the motives of his or her activity answers the question why he / she does it.

Motives determine the purpose of the activity. This is the guiding and controlling force of the activity. People tend to be guided not by individual, but by several motives, to act under the influence of not individual, but a number of needs.

Taken together, all these agents create a complex set of driving and guiding indicators of human activity. But «any activity is potentially dangerous» is the basic axiom of the BDZ. Among the individual personality traits that affect the safety of activity, motivation is paramount. It is the motives that is the psychological factor, on the basis of which it is likely to find the answer to the question why a person in some situation acts in this way and not otherwise.

In order to understand the reasons that motivate prudent people to intentionally go about breaking the rules, while exposing themselves to high risk, it is necessary to first disclose the motives for such behavior. Having identified these motives and the objective reasons behind them, it is already possible to find practical ways to eliminate or reduce the influence of the factors that give rise to unwanted motivation, as well as ways of psychological influences that favor the rejection of such motives.

In the activity the following substantive generative motives are revealed: benefit, safety, convenience, satisfaction and leveling in the labor collective. In addition, psychologists identify situational motives that reflect the overall orientation of the subject to achieve the goal (motivation for success) or prevention of failure (motivation to self-defense).

It was found experimentally that the advantage of motivation to prevent failure is inherent in people more prone to danger («birth trauma» from K. Marbe). Those workers who had many accidents preferred simpler and safer tasks, more focused on preventing failure (motivation for self-defense worked). Those who did not have their own accident experience, were not afraid of difficult and dangerous tasks, focusing mainly on achieving the goal.

The choice of motive behavior is influenced by such properties as temperament and value orientation of the individual. It has been observed, for example, that melancholic are more motivated by self-defense than by achieving a goal.

Psychologists identify two main areas of value orientation of the individual:

1. Orientation to the «I» (selfish thoughts predominate);
2. Task orientation.

Individuals with an «I» orientation are very sensitive to public opinion and very vulnerable when it comes to their reputation. They are dominated by the motive for striving for success.

Collectivist-type «task-oriented» people strive for objective, socially valuable results. In this position, people are most concerned about the possibility of failure. It should be noted that the stronger the motive for achieving the goal, the greater the risk of its failure. Therefore, it turns out that with a very strong motivation for success, people tend to choose simpler tasks in which there is less risk of failure.

Tendency to risk

The choice of a motive for behavior in a particular situation is predominantly determined by the psycho-physiological quality of the individual, which is directly reflected in the safety of his or her activity as a risk aversion. This quality not only determines the choice of more risky behavior, but also creates an underestimation of the possible danger. Let’s take a closer look at this.

Dictionary of the Russian Language S. I. Ozhegova cites two interpretations of the word «risk».

According to the first, «risk» is regarded as «possible danger», as a dangerous condition of action, for example, if a person consciously «takes risk» and with «risk to life» performs the duties of a firefighter.

According to the second approach, risk is regarded as a «good luck» action in the hope of a happy outcome, that is, an action at one’s own risk at

uncertainty. In this case, uncertainty may relate to the possibility of achieving the desired goal in such risky behavior (motivation to succeed) and the possibility of preventing physical danger (injury) in its implementation (motivation to self-defense). An example of risky action is when people intentionally violate safety rules in the hope that everything will work.

An analysis of different life situations shows that risk can also be a goal of activity if one is specifically at risk just to convince or show others that he or she is not afraid of danger (physical or unattainable). In this case, the risk becomes a means of self-affirmation.

Sometimes the risk is referred to as some need that manifests itself in the pursuit of danger. In this case, a person specifically chooses dangerous goals or dangerous ways to achieve them only for the sake of the risk and the associated thrills.

The behavior of a person in a dangerous situation depends not only on these objective conditions, but also on how adequately these conditions are reflected in his mind. According to research, the degree of adequacy of awareness of dangerous situations depends largely on the individual qualities of the individual. For example, people with a weak nervous system, anxiety, usually overestimate the degree of danger. People, however, driven by a strong desire to achieve the goal and to profit from it, sometimes, on the contrary, reduce the level of danger and consider it a manifestation of unlikely.

Assessment of psychological security of man

The psychological security of a person in the process of activity is assessed in the course of special instrumental research and using tests. For example, for instrumental evaluation, you can use an electromilisecondometer whose arrow should stop as close as possible to the indicated mark. When crossing this mark, the subject may have an electric shock.

Figure 6.1 (a, b) shows the results of comprehensive studies of the psychological security of the individual, evaluated by the success of the ***B***-index, which reflects the achievement of the goal in terms of physical danger. They studied the success of actions depending on the propensity to risk **R** , motivation of the individual to the success of **Mu** and motivation to self-defense of **MS** .

The main results of this kind of psychological research have shown the following:

1. On the propensity to risk, there are two groups of people for whom the ratio $P_1 > P_2$. The first group includes people with a more exciting nervous system and increased risk aversion. To the second – on the contrary.

2. The dependence of the success of actions on the motivation to Mu's success or motivation to self-defense MS is evaluated by curves with a maximum (Fig. 6.1 *a*, *b*).

3. People who are inclined to take risks are more successful than people who are not inclined to take risks – curves 1 lie above curves 2.

4. The maximum success of actions on curves $B=f$ (Mc) (Fig. 6.1 *a*) in people of the second group, not inclined to risk, is observed at higher motivation to self-defense than in people of the first group ($Ms_1 < ms_2$).

5. The maximum success of actions in both the first and the second groups is found at close values of motivation for success – the highest values of *B* are achieved at $Mu_1 \approx Mu_2$ (Fig. 6.1b).

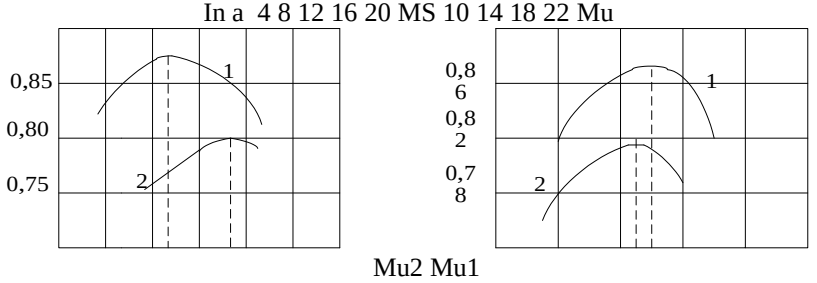

Fig. 6.1. Dependence of successful actions of people at risk (curve 1) and not at risk (curve 2), from motivation to self-defense (*a*) and to success (*b*)

Studies allow us to come to an important conclusion: the best results in terms of physical danger are achieved when people act according to their psychological type of motivation. Those at risk are better off with low self-defense motivation. Those who are not risk averse perform better when motivation for self-defense is high ($MS_1 < MS_2$). That is, motivation for self-defense of people who are not inclined to take risks cannot be regarded as a negative quality. In people of this psychological type, enhancing motivation for self-defense helps to increase psychological security in conditions of physical danger.

In this practical exercise, the questionnaires of T. Ehlers and Schubert have been used to quantitatively evaluate psychological qualities, which are widely used in scientific research.

Materials and appliances

The study uses tests:

– Schubert risk appraisal questionnaires;

– questionnaires to evaluate motivation to achieve the goal – motivation to succeed by T. Ehlers;

– Questionnaires to assess motivation to prevent failure – motivation to self-defense by T. Ehlers.

Recommendations to students

Test questions should be answered honestly and quickly enough, without thinking about each question for a long time. It should take 5–7 seconds to consider answering one question and no more than 4–5 minutes per test.

Before answering the test questions, you should clearly understand the options for the answers given.

The table recommended for fixing the answers of this text should be prepared in advance.

It is not necessary to become familiar with the methods of evaluating test results before testing and in the process of answering test questions to prevent distortions of results.

The order of performance of work

6.3.1. *Test 1.* Assessment of propensity to risk R.

Students are asked 25 questions, which are answered by choosing one of the following options:

Yes – «5»;

More so than no – 4; It is difficult to say – «3»; No more than «2»; No – «1».

The numbers corresponding to the selected answer options are written in a comma string.

The number of digits obtained during the test is summed up and divided by 25. The result of this action is a conditional quantitative assessment of the risk exposure of P_i for a particular student.

Determines the average value of the risk assessment p for the training group as a whole.

In the study group, the first subgroup with higher risk exposure ($P_1 > p$) and the second subgroup with less risk exposure (P p) are distinguished .

The average values of the quantitative assessment of risk exposure for the first P_1 and second P_2 subgroups are determined separately.

The results of the test are discussed and the ratios of the obtained values of p, P_1 , P_2 and the average value of quantitative assessment of risk exposure $P_{ser} = 3$, established as a result of numerous studies are analyzed .

6.3.2. *Test 2.* Evaluation of motivation for Mu's success.

Students are asked 41 questions. The answer is yes or no.

The selected answer to each of the questions is marked with a «+» and entered in the pre-prepared table. 6.1.

Table 6.1

The answers to tests that assess motivation to succeed m $_{in}$

№ запитання	Так	Hi
1	+	
2		+
3		
4		

In the layout of the table, the answer to the first question is yes and the second to no.

The completed table with the selected answer options is compared with the table below, the key to deciphering the test results (Table 6.2). The number of identical positions of the signs «+» in both tables is calculated, which indicates the presence of measured quality. The number obtained is a conditional quantification of one's motivation for Mu's success.

Table 6.2

The key to deciphering test answers 2

Question No	So	No
1		
2	+	
3	+	
4	+	
5	+	
6		+
7	+	
8	+	
9	+	
10	+	
11		
12		
13		+
14	+	
15	+	
16	+	
17	+	
18		+
19		
20		+
21	+	
22	+	
23		
24		+
25	+	
26	+	
27	+	
28	+	
29	+	

Продовження табл.

30	+	
31		+
32	+	
33		
34		
35		
36		+
37	+	
38		+
39		+
40		

The average values of the quantification of motivation to achieve success are determined separately for the first Mu_1 and second Mu_2 subgroups previously identified (test 1).

Analyzes the differences between Mu_1, Mu_2 and the average value of quantitative assessment to succeed $Mu_{August} = 16$.

6.3.3. *Test 3.* Assessment of self-defense motivation MS.

Students are offered 30 sets of 3 words. For each item you need to choose only one of the three words that most accurately characterizes the subject.

The answer option selected for each item is indicated by a «+» sign and entered in the pre-prepared table. 6.3.

Table 6.3

Answers to a test that assesses self-defense motivation

Item number	and	b	in
1	+		
2		+	
3			
…			
30			

In the layout of the table, as an example, the first word is selected in the column «a» of the test, and in the second item is selected the word in the column «b».

The completed table with selected answer options is compared with the following table, the key to deciphering the test results (Table 6.4). The number of equal positions of the + signs in both tables is calculated. The obtained number is a conditional quantification of the personality motivation for self-defense of MS.

The average values of the quantification of self-defense motivation are determined separately for the first MS_1 and the second MS_2 subgroups previously identified (test 1). Analyzes the difference between Mc_1, Mc_2 and the average value of quantitative assessment of motivation to defend $Ms_{August} = 15$.

Based on the results of the analysis, conclusions are drawn according to the goal of the lesson.

Table 6.4

Key to deciphering test answers 3

Question No	and	b	in
1		+	
2	+	+	
3	+		+
4			+
5		+	
6			+
7		+	
8			+
9		+	
10		+	
11	+	+	
12	+		+
13		+	+
14	+		+
15	+		+
16		+	+
17			+
18	+		
19	+	+	
20	+	+	
21	+	+	
22	+		
23	+		+
24	+	+	
25	+		+
26		+	
27			+
28	+	+	
29	+		+
30		+	

Report

The report should include:

1. The name and purpose of the work.
2. Tests used.
3. Testing protocols.
4. Conclusions.

Control questions

1. What factors characterize a person's ability to withstand danger in the process of activity?
2. What is the activator of the activity?
3. Why do you need to know the motives of the activity?

4. What are your main substantive motives for activity?
5. What are the motives for situational?
6. What individual personality traits depend on the choice of motive for behavior in a particular situation?
7. How can the term «risk» be interpreted?
8. Why is it necessary to study a person's «risk aversion»?
9. How is a person's psychological security researched in the process of activity?
10. How does the success of actions depend on risk aversion, motivation for success and motivation for self-defense?
11. How do the data obtained in this work agree with the known results?

TEST 1

1. Would you exceed the set speed to provide the necessary medical care to a seriously ill person as soon as possible?
2. Would you agree to take part in a dangerous and long expedition for good money?
3. Would you embark on the path of a dangerous fleeing criminal?
4. Could you ride on the foot of a freight car at a speed of more than 100 km / h?
5. Can you work normally after a sleepless night?
6. Would you be the first to cross a very cold river?
7. Would you lend a friend a large sum of money without being quite sure that he would be able to return the money to you?
8. Would you come in with a tidy cage with a lion to assure you it's safe?
9. Could you, under the supervision of a supervisor, climb a tall factory pipe?
10. Could you manage a sailboat without training without training?
11. Would you risk grabbing the bridle of a running horse?
12. Could you ride a bike after 10 mugs of beer?
13. Could you parachute jump?
14. Could you, if necessary, travel without a ticket from Kharkiv to Kiev?
15. Could you do a self-guided tour if your acquaintance, who recently got into a traffic accident, was driving?
16. Could you jump from a 10-meter height onto the awning of the fire brigade?
17. Could you go to a life-threatening surgery to get rid of bed rest?
18. Could you jump off the foot of a freight wagon traveling at 50 km / h?
19. Could you and seven other people climb a five-person elevator?
20. Could you go with a blindfold for a great monetary reward for a busy street intersection?
21. Would you take a life-threatening job if you paid well for it?
22. Could you, after 10 glasses of vodka, perform important calculations for you?

23. Could your boss, at the behest of your boss, take the high-voltage wire if he assured you that the wire was off?
24. After some preliminary explanations, could you control the helicopter?
25. Could you, with a ticket but without money and food, travel from Kharkiv to Lviv?

TEST 2

1. If there is a choice between the two options, it is better to make it immediately rather than delay it for a while.
2. I'm easily annoyed if I notice that I can't do the job 100 % at all.
3. If I work, it looks like I'm putting everything on the map.
4. If a problem situation arises, I most often make a decision one of the last.
5. If I have no business for two consecutive days, I lose my composure.
6. On some days my successes are below average.
7. I am more demanding of myself than of others.
8. I'm kinder than others.
9. If I give up a difficult task, then I strongly condemn myself because I know that I would succeed in it.
10. In the process of work, I need small breaks for rest.
11. Thoroughness is not my main feature.
12. My work achievements are not always the same.
13. I am more attracted to other work than the one I do.
14. Condemnation stimulates me more than praise.
15. I know that my friends consider me a business person.
16. Obstacles make my decisions even tougher.
17. It is easy for me to awaken ambition.
18. If I work uninspired, it's usually noticeable.
19. When doing work, I do not count on the help of others.
20. Sometimes I postpone what I had to do now.
21. You should rely solely on yourself.
22. There are few things more important in life than money.
23. Whenever I need to accomplish an important task, I think nothing else.
24. I am less ambitious than many others.
25. At the end of my vacation, I usually look forward to going to work soon.
26. If I am committed to work, I do it better and better than others.
27. It is easier and easier for me to communicate with people who can work hard.
28. If I have no business, I feel awkward.
29. I have to do responsible work more often than others.
30. If I have to make a decision, I try to do it as best I can.
31. Some of my friends find me lazy.
32. My successes depend, to a certain extent, on my comrades.
33. It is foolish to oppose the will of the leader.

34. Sometimes you don't know what work to do.
35. If something goes wrong, I'm impatient.
36. I usually pay little attention to my achievements.
37. When I work with others, my work produces better results than my colleagues.
38. I do not finish much of what I undertake.
39. I envy people who are not very busy.
40. I do not envy those who seek power and high office.
41. If I am convinced that I am on the right track, I am ready for extraordinary measures to prove my point.

TEST 3

No points	and	b	in
1	Bold	Vigilant	Adventurous
2	Gentle	Timid	Stubborn
3	Careful	Decisive	Pessimistic
4	Unstable	Cavalier	Attentive
5	Unreasonable	Cowardly	The one who does not think
6	Nimble	Brisk	Prudent
7	Cold-blooded	Fluctuating	Dashing
8	Rapid	Frivolous	Timid
9	The one that does not think	Organized	Unpredictable
10	Optimistic	Conscientious	Sensitive
11	Melancholic	Which is doubtful	Vacillating
12	Cowardly	Careless	Agitated
13	Imprudent	Quiet	Timid
14	Attentive	Unreasonable	Bold
15	Prudent	Fast	Courageous
16	Adventurous	Careful	Provident
17	Agitated	Dispersed	Timid
18	Cowardly	Unwary	Cavalier
19	Shy	Indecisive	Nervous
20	Executive	Devoted	Adventure
21	Prudent	Brisk	Desperate
22	Confused	Indifferent	Careless
23	Careful	Carefree	Patient
24	Clever	Caring	Brave
25	Careful	Fearless	Conscientious
26	Hurried	Shy	Carefree
27	Dispersed	Imprudent	Pessimistic
28	Careful	Prudent	Adventurous
29	Quiet	Disorganized	Timid
30	Optimistic	Vigilant	Carefree

PRACTICAL WORK № 5
Quantitative risk assessment the goal of the work

Students acquire skills to quantify the degree of risk of a particular class.

Terms

Potential danger is a universal feature of the process of human interaction with the living environment at all stages of the life cycle. The axiom of potential danger is a fundamental tenet of the BDZ. It determines that all human activities and all components of the living environment, especially technical means and technologies, apart from other positive properties and results, have the ability to generate dangerous and harmful factors. In this case, any positive action or result is inevitably accompanied by the emergence of a new potential hazard or group of hazards.

In each case, the occurrence of a hazard in the technical system is multi-cause, and its development passes through a chain of events. Variants of causes and the next goal of events can be predicted if you create a system based on an analysis of its structural structure and possible human actions in the maintenance or management of the technical system.

A thorough analysis of failures of technical systems and possible human misconduct contributes to the improvement of safety (reducing the risk of danger realization) by introducing protective and limiting means into the system, as well as by increasing the requirements for the professional training of engineers and employees.

The presence of potential danger in the system is not always accompanied by its negative effects on humans. To carry out such an action, three conditions must be fulfilled: the danger (harmfulness) actually works; the person is in danger zone; the person does not have sufficient protection and the necessary level of training.

Relatively complete (complete) security is only guaranteed by the first variant of the relative position of the danger zones *2* and the stay of the person *3* is remote control, surveillance, etc. (Fig. 7.1) In the second variant, there is a danger only if zones *2* and *3 are combined* . As a person in this common area is briefly visited (inspection, minor repairs, etc.), so is the danger only during this period; in the third embodiment, the danger can be realized at any time, and in the fourth variant – only if the functional integrity of the means of protection is violated.

The criterion for evaluating the actions and actions of a person in the presence of danger * is the risk, which is determined by the probability of occurrence (realization) of danger in the area of stay of the person and the probability of the presence of the person in the danger area (danger zone).

The relatively small (zero) risk indicates that there is no real danger in the system, and conversely, the higher the risk, the higher the reality of the effect of the danger on the person.

However, it is not possible to ensure zero risk in current technical systems.

The concept of acceptable (acceptable) risk has gained worldwide recognition. The content of this concept is in the pursuit of low risk.

Acceptable risk is the degree of risk that can be realized by existing technical means on the one hand and economically justified on the other. According to the statistics of foreign authors, the acceptable risk is $n \cdot 10^{-6} \div n \cdot 10^{-8}$.

A quantitative assessment of the degree of risk is required to develop effective security measures.

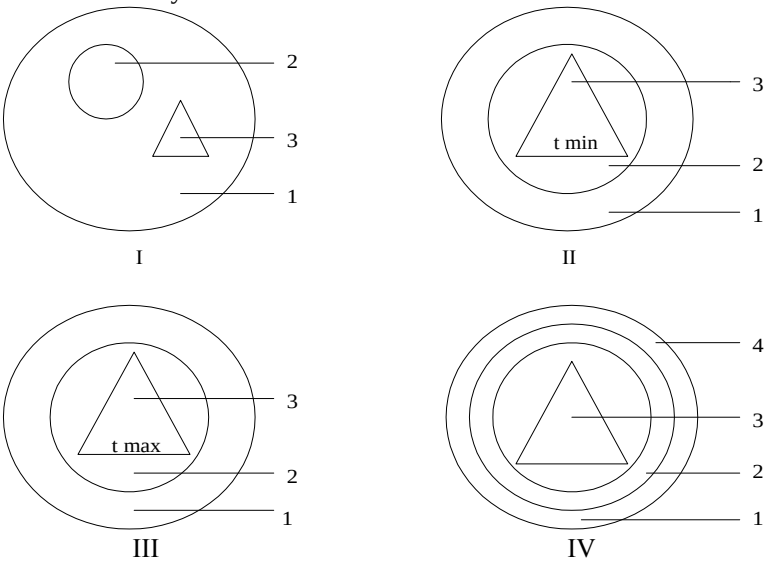

Fig. 7.1. 1. Variants of the relative position of the living environment;
2. danger zone;
3. areas of human habitation;
4. areas of protection:
I – safe situation; II – the situation of short-term or local danger;
III – a dangerous situation; IV – is a relatively safe situation

* Danger is a negative feature of the system «human – living environment» capable of causing damage caused by the energy state of the environment and human activities.

Quantitative risk assessment

Risk *R* is the frequency of realization of the danger of a particular species (class).

The risk can be defined as the frequency (dimension – the inverse of time 1 / s) or the probability of occurrence of event A (a dimensionless value lying in the range 0–1).

Security experts offer the most general definition: risk is a quantitative assessment of a hazard.

Quantification is the ratio of the number of adverse effects to their potential over a given period.

There are:

– individual risk;
– social risk.

Individual risk is the frequency of occurrence of the effects of a particular striking species arising from the realization of certain hazards at a particular point in space (where the individual may be).

The concept of «social risk» is introduced to assess the extent of catastrophic detection (realization) of danger.

Social risk is the frequency of occurrence of an event that involves the defeat of a certain number of people who are exposed to a particular species who are affected by the realization of certain hazards.

A person who works in an enterprise or lives in an area that may be in the area of destruction or danger is subject to risk during an accident. The level of risk depends on many factors, including the location of the person and time.

As a rule, the fact of the impact of the danger on the person is a random variable and is determined by the probability of finding a certain person in a certain place in the event of danger.

The probability of event A can be determined from the expression:

$$PA\,(n) = M \qquad (7.1)$$

where *M* is the number of favorable factors (cases); *n* is the total number of cases.

When analyzing individual risk, the nature of the accident, the proportion of time spent in the risk area and the place of residence of the risk taker should be taken into account.

The individual risk of death for resident A. can be determined from the expression:

$$Rn = TN\,PA\,(n) = N \cdot {}^{n}{}_{o} \cdot\cdot D\,td\,td \qquad (7.2)$$

where N_n is the number of inhabitants killed per year;

d – number of weeks per year;

D – the number of weeks that a resident of A. lives in a town or village;

td – number of hours per week; *t* is the number of hours per week when a resident is at risk;

T is the length of time for accounting statistics;

N_o – number of inhabitants in a town or village per year.

The individual risk of falling victim to an accident of any severity can be defined for the resident of A. by the expression:

$$PA\ (n) = (N_n + N_{¼}\,\text{p}) \cdot \check{Z} \cdot t^{R^\circ} \qquad (7.3)$$

where N_{tp} is the number of injured residents.

Procedure of work

Using these guidelines, to get acquainted with the nature of the origin of the dangers, the conditions of realization of the negative effect of the danger on the person, the quantitative assessment of the degree of risk.

Obtain an individual task for the teacher to calculate individual risk.

After completing the task and having it checked by a teacher, discuss the work done and summarize.

Control questions

1. To give definitions of concepts «danger», «risk».
2. The Axiom of Potential Threat.
3. Give examples of the negative impact of danger (harm) on a person and the conditions for its realization.
4. Quantitative risk assessment.
5. Qualitative risk assessment.
6. Individual risk.
7. Social risk.
8. Acceptable risk.

TASKS for the calculation of individual risk

OPTION 1

1. To determine the risk of injury to a person in production in Ukraine in 1996, if it is known that in general, 65,000 people were injured in the national economy and the number of employees is 15 million.

OPTION 2

1. To determine the risk of death of a person in production in Ukraine, if it is known that in 1996 as a result of accidents at work, 1.9 thousand people were killed. The number of employees is 15 million people.

OPTION 3

1. About 127.5 thousand people are killed annually in Ukraine due to various dangers. Taking a population of 50,000,000 people to determine the risk of living in the country.

2. Compare the data obtained with the risk of human habitation in the former USSR, if it is known that about 500 thousand people were killed as a result of various hazards. With a population of 300 million people.

OPTION 4

1. To determine the tendency in the amount of risk of living of a person in the Kharkiv region, if it is known that in 1997, 5 279 people were fatally injured as a result of non-productive injury, and in 1998 – 4 742 people, with a total population of 3 million people. .

OPTION 5

1. To determine the individual risk associated with traffic accidents in the Kharkiv region, if it is known that in 1998, 359 people died in an accident. With the total population in the region of 3 million people.

OPTION 6

1. To compare the individual risk of electric shock among residents in the Kharkiv region, taking into account the population of the region of 3 million people, if it is known that in 1997 97 people died and in 1998 – 46 people.

OPTION 7

1. To determine the risk of death in a year from accidents related to the operation of vehicles, if 63 thousand people were killed annually in the former USSR. The population of the USSR was 300 million people.

OPTION 8

1. Determine the risk of death for a year from industrial accidents, if annually in the former USSR from the death of 287 thousand people. The population of the USSR was 300 million people.

OPTION 9

1. To determine the risk of death of a person in a year from industrial accidents in the Russian Federation, if it is known that in 1990, 8.2 thousand people died. Number of employees in the production of 25 million people.

OPTION 10

1. To determine the risk of human death in production for a year in the world, if it is known that 200 thousand people die in the world annually. The number of employees in the production of 2.4 billion people.

OPTION 11

1. To determine the individual risk caused by poisoning, if it is known that in the Kharkiv region as a result of poisoning in 1996 suffered 1 120 people. With a total population of 2,997.9 thousand people.

OPTION 12

1. To determine the individual risk of injury to a person in Kharkiv as a result of the fall, taking into account that 10 thousand people are injured annually. With the total population of the city 1,510 million people.

OPTION 13

1. To determine the risk of death of a person in production in 1989 in the former USSR, if it is known that in 1989 killed 14.5 thousand people, the number of workers in the production of 138 million people.

OPTION 14

1. To determine the risk of death of a person for a year in manufacturing in mechanical engineering, if it is known that in 1990 killed 400 people. With the total number of employees 2.3 million people.

OPTION 15

1. To determine the individual risk of injury to a person in the former USSR in production, if it is known that in 1990, 677 thousand people were injured, the number of workers in the production is 138 million.

OPTION 16

1. Determine the individual risk of injury to a person in a machine-building industry if it is known that 58.6 thousand people were injured in 1990. With the total number of employees 2.3 million people.

OPTION 17

1. To determine the risk of injury to a person in the former USSR while operating vehicles, if it is known that in 1990, 350,000 people were injured. With a total population of 300 million people.

OPTION 18

1. Determine the individual risk associated with occupational diseases, taking into account that in the United States in 1991 received 400,000 occupational diseases. With the total number of employees 120 million people.

OPTION 18

1. Determine the individual risk of becoming disabled at work in the former USSR, if it is known that in 1990 about 25,000 workers became disabled at work. Number of employees in the production of 138 million people.

OPTION 19

1. To determine the risk of human death from environmental diseases, if it is known that 1.6 million people die annually from environmental diseases on the globe. With a total population of 6 billion people.

OPTION 20

1. To determine the individual risk caused by poisoning, if it is known that the number of poisonings with lethal end at work and in everyday life in 1990 in the former USSR reached 50 thousand with a total population of 300 million people.

OPTION 21

1. To determine the risk of death and injury of a person in a fire, if it is known that during the fires in the former USSR in 1990 8.5 thousand people were killed, more than 10 thousand people were injured. With the total population of the country 300 million people.

OPTION 22

1. To determine the risk of death and injury to man as a result of natural phenomena, if it is known that the natural phenomena in 1991 led to the death of 250 thousand people. and threatened the lives of about 25 million people. With the total population of the globe 6 billion people.

OPTION 23

1. Determine the risk of human deaths due to earthquakes in the world, if it is known that more than 52,000 people died in the 1990 earthquake. With a total population of 4.8 billion people.

OPTION 24

1. To determine the risk of death of a person in a fire in Ukraine and in the Kharkiv region, if it is known that during the fires in 1996 1,200 people were killed in Ukraine, in the Kharkiv region 149 people. With a population of 2,997,9 thousand in the Kharkiv region, and a population of Ukraine – 49,3 million.

OPTION 25

1. To determine the individual risk of injury to a person in Kharkov as a result of the fires, if it is known that 85 people were injured in 1998. With a total population of 1.51 million people.

OPTION 26

1. To determine the risk of personal injury in the Kharkiv region at work, if it is known that in 1998, 1388 people were injured. With the total number of employees 1 million people.

OPTION 27

1. Determine the individual risk for resident A. living in N with a population of 1.51 million. Statistics for 10 years show that during this time, 60,000 people were killed in the city population, 120,000 people were injured.

2. The resident of the city N 40 hours a week works in the city, 4 weeks a year goes on vacation, 3 weeks every year he goes on business trips, 56 days a year works in the country, and the rest of the time is in the city.

OPTION 28

1. Determine the individual risk for resident A. living in a village with 200 residents. From among the villagers for 10 years 5 people. 50 people were killed. Were injured.

2. Resident A. works 40 hours a week in the nearest town N, leaves the village for vacations 4 weeks a year, goes on business trips for 2 weeks each year, works for the country for 56 days a year, and remains in the village the rest of the time.

PRACTICAL WORK № 6
Determination of human chronotype the goal of the work

Learn how to identify a person's chronotype and learn how to study the sleep-wake biorhythm and determine the body's ability to adapt.

General Information

Functionality of an organism varies in time. During the day, the mental and physical performance of a person undergo rhythmic fluctuations: the period of high activity changes with low alertness alternates with sleep. Such a rhythm of life counteracts the depletion of the body's resources, provides a dynamic balance of its internal environment. Daily rhythm of performance is different in different people. It defines a person's chronotype. People of different chronotypes differ in features of the physical and mental spheres, have different character, unequally respond to external stimuli.

Maintaining a rhythm of work and rest adequate to a certain chronotype is an important element in maintaining the physical and mental health of a person, preventing accidents and ensuring a high level of mental and physical activity. Disordered sleep-wake rhythm can lead to serious illness. Therefore, for the organization of safe work and rational rest, as well as to establish the level of compatibility of individuals and professional selection, it is necessary to determine the chronotype of the person, its adaptive capabilities.

Methodical instructions

1. To study general information about human biorhythms and their influence on well-being and performance. At the same time, focus on the classification of biorhythmological types, given the unequal vulnerability in different people of periodic fluctuations in functional status and performance. Understand the risk of biorhythm mismatch and the role of various stressors in the process and the importance of preventive measures (Sections 10.3 and 10.4).

2. To get acquainted with theoretical provisions concerning daily biological rhythms and their influence on human life (section 10.4). Note the possibility of different diseases associated with the mismatch of daily biological rhythms and their prevention.

3. Check the quality of mastering the theoretical material by answering the control questions (section 10.8). Discussion is possible through an exchange of views on important theoretical positions, as well as brainstorming.

4. Identify your chronotype and summarize the data obtained from students in your group (Chapter 10.6, Task 1).

5. Investigate the individual sleep-wake cycle (Section 10.6, Task 2).

6. Set your adaptation property for the duration of an individual minute (section 10.6, task 3).

7. Analyze the results and determine the possibility of using the data obtained in planning their own modes of work and rest.

8. Report (section 10.7).

Human chronotype and its influence on life activity

Depending on the location of acrophases (peaks) of biorhythms (BR) people are divided into three main chronotypes:

– «larks» (morning);
– «pigeons» (daytime);
– «owls» (evening).

The terms «larks» and «owl» were coined by Dr. G. Lambert in 1939. They differ in the functionality of the body at one time or another. «Larks» in the morning have a clear synchronization of the performance and functional state of the nervous system. They reach a high level of performance immediately after waking up and work well in the morning. They wake up early and go to bed early. In the first half of the day their performance is highest. In «owls» – on the contrary: in the morning times the lowest threshold of excitability of the nervous system is noted. They reach high working capacity in the evening. The Owls wake up late and fall asleep at midnight. People in the chronotype of the «pigeons» have features inherent in both «larks» and «owls». They do not like to get up very early, but they get to bed not too late, like a normal 7–8 hour sleep. Their performance has two peaks – at 10–12 and 15–18 hours. According to the results of N. Neverova among students the morning type was observed in 36 %, intermediate – in 19 %, and evening – in 45 % of the total number of studied.

People of different chronotypes respond differently to many external stimuli, including the effect of drugs and even their doses. For example, equally trained athletes, who differ in chronotype, have a mixed reaction to staying in the sauna. In the owls at 9–10 in the morning after the stay in the sauna, the pulse rate is much higher than in the «larks» and «pigeons». In the evening – on the contrary, a more intense reaction of the cardiovascular system are «larks». Chronotypes also differ in their susceptibility to disease. Thus, almost twice as many patients with hypertension were found among the students of «larks» than among the students of «owls». This, A. Putilov notes, is due to the fact that the «larks» tend to carry the causes of conflicts on their own account; they, more than others, are in a state of anxiety and depression. In «owls» there is a more active desire to overcome difficulties. Lark students go to the doctors about cardiovascular diseases two and a half times more often than students «owls». At the same time, owls are higher

than the first in total number of doctor visits and are often worse off. Researchers I. Ganelin and I. Brusov found that the onset of myocardial infarction in «owls» is observed in the evening, in «larks» – in the morning, in «pigeons» – with equal probability at any time of day. At the same time, men who are «larks» who have suffered myocardial infarction are half as many as men who have «owls». This trend persists among women. In addition, the «larks» have a 24-hour rhythm of life, synchronized with the astronomical age. In «owls» it is slightly larger than 24 hours. When using «larks» for night work, they can cause diseases of the gastrointestinal tract and cardiovascular system.

It is believed that each chronotype of a person has a specific character. It is assumed that this is due to different thresholds of excitability. English psychologist G. Eysenck found that «owls» are more often than «larks» are extroverts, that is, their interests are directed primarily to the outside world. As a rule, they have no obstacles in communicating with people. They are characterized by company relationships, a wide range of acquaintances, optimism, change of mood and hobbies, weak control over emotions and feelings. «Larks» – on the contrary, more often than not «owls» are introverts, that is, they perceive the world and people as though through the lens of their own, sometimes far from reality, ideas about them. Most often, these are calm, shy, closed to outsiders and focused people who can keep their feelings under control, love order and plan their actions in advance.

V. Doskin made a personal portrait of a lark student and an owl student. The first in love sticks to the generally accepted views, but peculiar in the perception of specific situations. Failures make him doubt his strength, cause anxiety and agitation, worsen mood and anxiety. Such a student focuses on his own well-being and tries to avoid conflicts. Another easily forgets his failures and troubles. He is not scared by possible difficulties, conflicts and emotional problems. Such a student is less worried about the exams and is well aware of the nature and behavior of others.

The chronotype of a person throughout life does not remain unchanged. With age, the person acquires the features of a «lark», while at the age of 16–20 years the person more expressive features of the «owl».

In Western countries, the human chronotype is receiving serious attention. Large enterprises and organizations choose only owls for night shifts. It increases productivity, reduces injuries and the percentage of errors. It is noticed that among highly skilled athletes there is a spontaneous selection by chronotype. For example, among hang gliders, «larks» predominate, and «owls» are part of water polo teams.

Thus, a chronotype is a property of a human body that can determine its behavioral activity. Therefore, it can be a guide in organizing a rational

mode of life. It is determined to organize the rhythm of sleep-wakefulness, which is the basis of good health, efficient and safe work, as well as in the case of professional selection and determination of the level of compatibility of individuals.

Special questionnaires are used to determine the chronotype. The most famous of these are the Horne-Estberg and Torswell-Okerstedt questionnaires. However, they are gradually being replaced by new ones. In 1987 O. Putilov developed a questionnaire to assess the difference between people by the nature of the daily variability of the alert level. It is given in Tasks 10.7.1 and 10.7.2.

The concept of biological rhythms of man

Biological rhythms (BRs) mean changes in the intensity and nature of biological processes and phenomena in living organisms that are recurring. Biological rhythms are also called biological clocks. At present, about 300 physiological functions have been detected in humans, which change periodically. Science that studies biological rhythms is called chronobiology, or rhythmology. It was formed as an independent scientific area in the 1960s of the XX century.

For BR is characterized by the existence of a period of strengthening the activity of the organism, which is replaced by a period of weakening of its functions. Such a pattern is the optimal form of existence of the organism, which provides maximum saving of resources, as well as maintaining its homeostasis (relative constancy of the internal environment of the organism). This is one of the mechanisms of adaptation (adaptation) of the organism to changing living conditions. Knowledge of this important feature of BR can be used to manage performance and maintain health in high emotional and physical stress.

BR can be regarded as an oscillatory process in a living system. On the time axis, it is described by a sine wave. BRs can be represented by the following parameters: period or frequency, amplitude, phase (acro- and orthophase) and rhythm waveform. The period is the time between the same state of adjacent cycles. It is expressed in units of time. Frequency is the number of cycles completed per unit of time. The amplitude is half the distance between the maxima of the sine wave, the largest deviation from the mesor. The mesor is the average of the values of the studied biorhythm parameter. Acrophase is the time of maximum function. Orthophase (or nadir) is a minimum of function.

In the case of convergence of frequencies of periods of oscillation or acrophase of two or more rhythms, their synchronization takes place. Environmental phenomena, which periodically recur and affect the frequency and acrophase of BR, are called synchronizers. In humans, there are two types of synchronizers – natural (physical) and social. Physical

synchronizers include changes of day and night with alternation of light and dark, daily fluctuations of humidity, barometric pressure. Social synchronizers are the order of production, household or other activities.

The resolution and reorganization of BR is called desynchrosis. It is caused by various stressors, factors that cause stress (excessive physical activity, high and low temperatures, toxic substances, information overload, the need for a particularly responsible decision, etc.). And can lead to various diseases. Desynchrosis is internal and external. The internal occurs inside the body. For example, disturbance of a rhythm of a food on a rhythm of a dream-wakefulness. External occurs when the synchronous BR and the phase changes of the environment, for example, when moving a person from one time zone to another. Desynchrosis can be overt and covert. The manifest manifests itself both in objective indicators (changes in blood pressure, sleep disturbance, etc.) and in subjective ones (irritability, loss of strength). In the case of latent desynchrosis, there is only a slight discomfort. Data on the cyclicity of biological processes are used as a universal criterion for assessing human health.

By origin, BRs are divided into two types – exogenous and endogenous. Exogenous BR occur as a reaction of the body to periodic changes in environmental factors (temperature, light, gravity, pressure, etc.). They are also called geophysical or ecological. For example, magnetic disturbances cause a change in heart rate, a decrease in blood pressure, an increase in heart rate. Endogenous BRs are generated by the body itself and occur on the basis of self-regulatory processes. They are functional because they are caused by metabolic processes. For example, daily dynamics of pulse rate, frequency and depth of breathing, level of blood pressure and physical capacity of heart, rhythms of the gastrointestinal tract, rhythm of sleep-wake.

The rhythms of different biological processes are very diverse. Thus, the highest heart rate is recorded at 13–14 and 22–23 hours. Blood pressure is minimal in the early morning and around midnight, and maximum at 16–20 hours. The maximum values of muscle strength are set at 5, 12, 16, 20 and 24 hours, and the minimum – at 2, 9, 14, 18 and 22 hours.

The periods of oscillation of biological processes range from fractions of a second for processes in the nervous system, receptors, muscles up to a year and more for physiological changes in the state of the whole organism.

The magnitude of the period is the basis of BR classifications. The most common is the classification of F. Halberg. He divided the BR into three main groups:

– rhythms with high frequency (micro rhythms) with a period of up to 0.5 h (for example, electrical activity of the brain, heart rate); – rhythms of medium frequency (mesorhythms) with a period of 0.5–28 hours.

Mutorisms include:

a) ultra-radiation up to 20 h (for example, rhythms of internal secretion, fluctuations of metabolism);

b) circadian up to 28 h (eg sleep-wake rhythm);

– low frequency rhythms (macro rhythms). These include: (a) Circumstantial or diurnal variations (eg fluctuations in energy metabolism and body temperature); b) circulatory or 20-day period (for example, changes in the number of neutrophils in the blood and their phagocytic activity, excretion (excretion) of corticosteroids and adrenaline); C) cirrcriginal (monthly) with a period of about 30 days (for example, hormonal cycles); d) zircon or zircon (annual), for example, «male» and «female» rhythm of change of physical performance.

Circus-triggered rhythms include BR with a length of 23 days (physical cycle), 28 days (emotional cycle) and 33 days (intellectual cycle).

The starting point of endogenous BR is the moment of birth, and regardless of whether the person was born just after nine months from conception, normally or through surgery.

There are three major biorhythmic types of humans: the labile type of person whose BR is mobile; inert human type, with delayed restructuring of all body functions (such a person has low performance during the period of vigilance) and stable human type with a clear BR amplitude that can be predicted. Along with this S. Stepanova intermediate biorhythmological type was established. It is a person with a pronounced incongruity of adjustment and the duration of inconsistency of internal functions.

The shape of the BR, their amplitude is significantly affected by human age. During the aging of the organism, the amplitude of the BR may decrease and the BR will shift. Similar processes are caused by stress effects. It is likely that this is a reflection of the total changes in the body that occur from the beginning of life to death. It is established that with age the physical time for the body accelerates. The second life of an elderly person is much poorer by physiological processes than the second life of a young organism. At a young age, physical time flows more slowly. French scientist Du Nuyi has determined that one year of a 5-year-old child lives 10 times longer than one year of a 50-year-old man. At different ages, people need different amounts of physical time to perform the same physiological work. It depends on the intensity of the metabolism, which is different at different stages of individual development. That is why the intensity of all processes at a young age is much higher than at adulthood.

Every 13 years, the biological clock hands rotate fully. In terms of the ability of the eyes to adapt, this is expressed in the following: every 13 years, the time of adaptation of the eyes after exposure to bright light is doubled.

For the first time the existence of its own standard of time was established by N. Moiseev and V. Sistsev, who called it an individual moment. In practically healthy people with high capacity for adaptation in the face of changing environment and high emotional, intellectual stress, the individual minute is «stretched» and exceeds one minute of physical time by 2–10 seconds.

With poor adaptability and sick people, the individual minute is reduced to 46-53 seconds. For people trying to commit suicide because of their inability to find a way out of a conflict situation, the individual minute is reduced to 22–28 seconds.

It is possible to determine the adaptive capacity of the organism by the duration of an individual minute by means of a special test given in Task 5.3 of these methodical instructions.

Thus, information about their own BR is necessary for a person to choose a rational mode of work and rest, determine the time of potential readiness of the organism to perform large mental and physical activities, to identify the hidden capabilities of the organism for best results. Knowledge of adverse – «critical» periods allows to avoid failures, life complications, health disorders.

Daily biological rhythms

Daily (circadian) BRs are among the main BRs of the body. They make an important contribution to the adaptation of the organism to the changing environmental conditions and above all to the daily rotation of the Earth around its axis. These BRs can be observed in individual cells, tissues, organs, in the activity of the body as a whole.

The daily cycle can be divided into three phases, which differ in metabolism (metabolism) and activity of biosystems – the activity phase, the recovery phase and the preparation phase for active activity. The phase of preparation for active activity begins in the early morning. The recovery phase covers night hours. This pattern of cyclicity of biological processes is supported by social and external time sensors. They have a synchronizing effect on the body. The initiator of all circadian oscillations of the body is the electrical activity of the suprachosmatic nuclei of one of the parts of the brain – the hypothalamus. It changes in the form of close to sinusoidal oscillations with a period approaching daily and is capable of phase changes under the action of light pulses.

Daily fluctuations are registered in indicators of the circulatory system, digestion, metabolism, in the activity of the neuroendocrine system, etc. In humans, the daily rhythm was detected for more than 50 functions. It is established that each organ has its time point defined – the period of especially intense activity. It is at this time that the organ is most vulnerable

to various adverse effects and is better amenable to therapeutic procedures. For example, for the liver, the lowest performance is observed at night at 1–3 hours, the kidney – at 17–19 hours.

During the day, the body's sensitivity to pain and cold, the effects of drugs and toxic substances (including alcohol) change. The greatest severity of pain is felt from midnight to 6 pm, the lowest – from 18 to 24 hours.

Daily fluctuations in vital activity indicators are not only the result of the direct influence of the rhythms of the external environment, but also of the internal organism. In the absence of any time sensors, in the conditions of the so-called «free time», the daily rhythm of a person can change from 19 to 29 hours. Well-known biorhythmologists Y. Ashof and R. Wefer conducted experiments to isolate people from the outside world in a special bunker near the town of Erling-Andehs in western Germany. The experiments involved about two hundred volunteers who agreed to spend under such conditions for almost three weeks. Within a week, these people had circadian fluctuations in excess of 24 hours. In 60 % of people surveyed in the hopper, the wake-up cycle was approximately 25 hours, in others 12 to 15 hours, and in some 16–18 or 32–36 hours and even 65–70 hours. The rhythm of the body temperature in one group of people in bunker conditions was shorter than 24 hours, in the other – more than 26 hours.

With age, the daily rhythms of the individual indicate life may change. C. Sissler's research shows that the minimum temperature of a person's body aged 60–85 years in a constant regime is 4 in the morning, and in people 20–35 years – at 6 in the morning.

According to experts, the age-related course of BR is associated with changes in the nature of the secretion of «night hormone» – melatonin, which is produced by the pineal gland (epiphysis), and is an important link in the regulation of circadian oscillations of biosystems. The synthesis of this hormone comes from the substance serotonin. The amount of melatonin decreases with age with respect to the amount of serotonin. This leads to a decrease in the degree of consistency of oscillatory processes in the body.

One of the main circadian rhythms of the body is the sleep-wake rhythm. Inconsistency of this BR with the rhythm of the environment leads to symptoms of depression and mania. Japanese scientists have come to the conclusion that the antisocial behavior of «complex» teenagers and their physical ailments are caused by a mismatch of circadian rhythms and their period is longer than a day.

On days when the mismatch of social and internal rhythms is too great, the teenager begins to bully, miss classes, complain of headaches, daytime drowsiness and poor nighttime sleep.

When working at night, the phases of activity and rest change places. This is accompanied by a mismatch of rhythms of somatic and autonomic functions. If such a process is repeated, it contributes to the development of diseases such as gastritis and peptic ulcer.

The most important conditions for maintaining the normal state of the body and high performance is to maintain a steady rhythm of sleep. Recovery of BR is carried out with the help of complete or partial sleep deprivation at certain critical times of the day. To combine the phases of BR and their synchronization use bright light, the drug melatonin and vitamin B12.

Numerous studies have made it possible for biorhythmologists to conclude that changing modes of work should be either very fast (every two to three days) or very slow (every three to four weeks). In the first case, the restructuring of circadian rhythms is just beginning and does not have time to develop fully, so severe violations of the condition and performance of a person does not occur. Otherwise, the person is in a state of restructuring for a smaller part of the time and their health and performance are not harmed. The state of the sleep-wake cycle can be determined by a special test. It is given in Problem 10.6.2.

Practical tasks and sequence of their implementation
Definition of own chronotype
Questionnaire for determining human chronotype

Question

You had to go to bed 4 hours later than usual. The duration of your sleep does not limit anything. Will you be able to wake up later than always and for how long?

a) I will not be able to wake up later than always
b) wake up later in the hour
c) wake up later for 2 hours
d) wake up later for 3 hours
e) wake up later for 4 hours

During the week you went to bed and woke up when you wanted. How long do you need to get to sleep at 11am?

a) 10 minutes or less
b) 15 minutes
c) half an hour
d) about an hour
e) more than an hour

If you go to bed at 11 o'clock for a long time and wake up at 7 am, what will be the dynamics of your physical activity?

a) with the evening peak
b) daytime peak
c) with morning and evening peak
d) with morning-peak
e) with morning peak

Imagine being on a desert island. You have a clock. When would you like your island to shine?

a) at 9 am or later
b) between 6.30am and 6.50am
c) between 6.30am and 7am
d) between 7 and 7.10 in the morning
e) after 7.10 in the morning

During the week you lie down and wake up at your own discretion. Tomorrow we would like to wake up at 7am. Wake you up to no one. What time do you wake up?

a) before 6.30 in the morning
b) between 6.30am and 6.50am
c) between 6.30am and 7am
d) between 7 and 7.10 in the morning
e) after 7.10 in the morning

Every day for 3 hours you have a difficult task to do (it takes all your strength and attention). What hours would you choose to work?

a) from 8 to 10 in the morning
b) from 9 am to 12 noon
c) from 10 am to 1 pm
d) from 11 am to 2 pm
e) from 12 am to 3 pm

If you do not sleep at your usual time, when do you feel exhausted (lethargy, drowsiness)?

a) only after bedtime
b) after sleep and after dinner
in the afternoon
d) after lunch and at bedtime
e) just before bed

When are you free to sleep, how long do you want to wake up?

a) at 11 am or later
b) at 10 am
c) at 9 am
d) at 8 am
e) at 7 am or earlier

Chronotype evaluation scale

The amount of points that fits your answers	**Chronotype evaluation**
More than 32	Typical «owl» (evening type)
28–32	Moderate «owl» (evening type)
21–27	Pigeon (Intermediate Daytime)
16–20	Moderate Lark (Morning-Day Type)
Less than 16	Typical lark (morning type)

Report

The report indicates:

1. The name of the work.
2. The goal.
3. The name of the task.
4. Equipment and materials used in the work.
5. Results of the conducted researches.
6. Conclusions.

Control questions

1. What are biological rhythms?
2. What is the most important feature of biological rhythms?
3. What parameters characterize the biological rhythm?
4. What are biological rhythm synchronizers?
5. Why are cyclical data used to assess human health?
6. What kinds of biological rhythms do you know, what are their peculiarities? What is the parameter assigned to the classification of biological rhythms?
7. List the main biorhythmic types of people.
8. Describe the main chronotype of a person.
9. What is the main rhythm of the circadian cycle?
10. Why does a person need information about the daily rhythms of the body?

PRACTICAL WORK№ 7
Provision of first aid in case of accidents the goal of the work

To study the basic principles of rendering pre-medical care in case of loss of consciousness, traumas, thermal effects, poisonings and special types of traumas; see the rules for using artificial respiration.

Basic theoretical provisions

In humans, death is not a one-time process. There are two stages – clinical and biological death. A sign of clinical death is the cessation of the most important life functions: loss of consciousness, lack of palpitations and breathing. However, at this time, most cells and organs are still alive, and they are still undergoing self-renewal processes. Therefore, it is possible to bring the body back to life. Of course, it is only possible to return to life from a clinical death when vital organs are not damaged. The internal structure of the person is shown in Fig. 11.1.

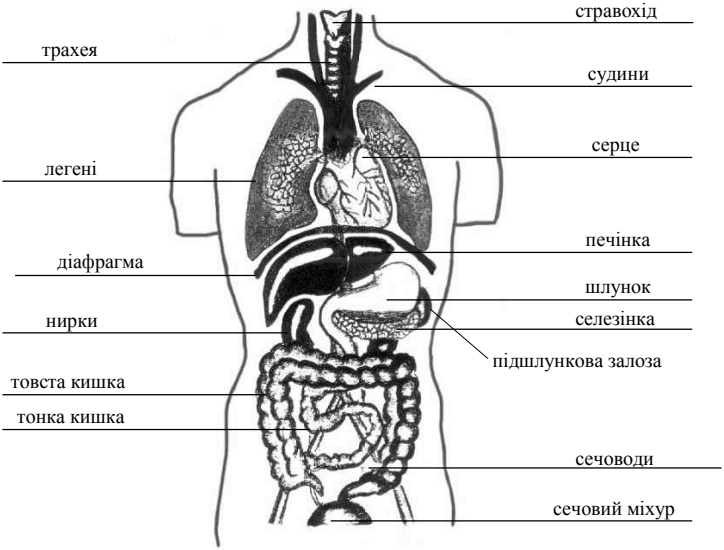

Fig. 11.1. The internal structure of man

It should be remembered that the activities of organs and physiological systems are required to ensure the processes of vital activity and perform various functions. For example, oxygen is supplied to cells and carbon dioxide is eliminated through the joint activity of the respiratory,

circulatory, and blood systems. The movement of the nervous system and muscles is required to ensure movement.

In case of loss of consciousness, trauma, thermal effects, poisoning and special types of traumas it is necessary to know the basic principles of first aid.

First aid is a set of simple, appropriate actions aimed at maintaining the health of the victim. First, if there is a need and an opportunity, the victim must be removed from the scene. Second, examine the damaged areas of the body, assess the condition of the victim, stop bleeding and treat these areas. Then immobilize the fractures and prevent traumatic shock.

When providing first aid, the following principles must be followed: correctness and expediency, speed, thoughtfulness, determination, calmness.

The first aid provider should know the basic signs of violation of vital functions of the human body, the general principles of rendering care and its methods regarding the nature of injuries received.

The first aid person should be able to assess the condition of the victim and determine what kind of assistance he or she needs first; to provide artificial respiration «from mouth to mouth» or «from mouth to nose» (Figs. 11.2, 11.3), external heart massage (Figs. 11.4, 11.5) and to evaluate their effectiveness temporarily stop bleeding by applying a plait, a tight bandage (Fig. 11.4, 11.5) 11.6) by finger pinching of a vessel; to apply dressing in case of injury (injury, burns, frostbite, blows); to immobilize the damaged part of the body in case of bone fracture, severe blow, thermal injury; to assist with heat and sun strikes, drowning, poisoning; vomiting, loss of consciousness; to use improvised means for carrying, loading and transportation of the victim; determine the need for removal of the victim by ambulance or by-pass transport; use a first aid kit.

Consistency of first aid: eliminate the effects on the body of factors that threaten the health and life of the victim (release from the electric current, remove from the contaminated area, put out burning clothing, remove from water), assess the condition of the victim, determine the nature and severity of injuries, that pose the greatest threat to the life of the victim and the sequence of measures to save him; to carry out the necessary measures to rescue the victim in the order of urgency (release the airway, perform artificial respiration, external heart massage, stop bleeding, immobilize the place of fracture, impose a bandage, etc.), maintain the basic vital functions of the victim before arrival; call an ambulance or doctor or take measures to transport the victim to a nearby medical facility.

Only a doctor is allowed to conclude that the victim has died. There must be first aid kits and posters with first aid rules, artificial respiration and external cardiac massage displayed in prominent places at the regular duty staff.

For the proper organization of first aid, the following conditions must be fulfilled: at each enterprise, in the shop, responsible persons should be

appointed for the proper condition of the devices and aids provided in first aid kits and bags, and for their systematic replenishment. The same persons are responsible for the transmission of first-aid kits and bags according to the changes in the special journal. The manager of the health care facility operating the facility must arrange for strict annual controls on the application of first aid rules, as well as the condition and replenishment of first aid kits and bags with the necessary first aid supplies and supplies. Assistance to the victim provided by non-medical workers should be strictly limited to certain types (measures) of recovery for «visible» death, temporary stoppage of bleeding, dressing, guardianship or frostbite, immobilization of the fracture, transfer and transportation of the victim. The first aid kit stored in the shop or in the first aid bag must contain the medicines and supplies listed in the table. 11.1.

Table 11.1

Medicines and first aid supplies

1	2	3
Teaspoon Iodine tincture (5 %) Ammonia	Preparation of solutions Lubrication of tissues near wounds, fresh scratches on the skin, etc. Assistance to the unconscious	1 bottle (25 ml) 1 bottle (30 ml)
boric acid	Preparation of a solution for washing eyes and skin, mouth rinsing during burns with alkali, for lotions on the eyes during burn with an arc	1 pack (25 g)
Drinking soda	Preparation of eye and skin washing solutions, oral rinsing with acid burns	1 pack (25 g)
Hydrogen peroxide solution (3 %)	Stopping of nosebleeds	1 bottle (50 ml)
Valerian tincture Nitroglycerin	Calming the nervous system During severe pain in the heart area and behind the sternum	1 bottle (30 mg) 1 bottle

Fig. 11.3. Artificial respiration from mouth to nose through a transition tube

Notes:

1. The solution of soda and boric acid is provided only for workplaces where work with acid and alkali is carried out.

2. In workshops and laboratories where the possibility of poisoning and gas and harmful substances may not be eliminated, the contents of the first aid kit must be filled accordingly.

3. The first aid kit does not include tires, a rubber bubble for ice, a teaspoon, boric acid and baking soda. Other medicines are supplied in the amount of 50 % listed. 4. The inside doors of the first aid kit should clearly indicate which

Fig. 11.4. Assistance to the victim by one person dicaments are used for various injuries (for example, during bleeding from the nose – 3 % solution of hydrogen peroxide, etc.)

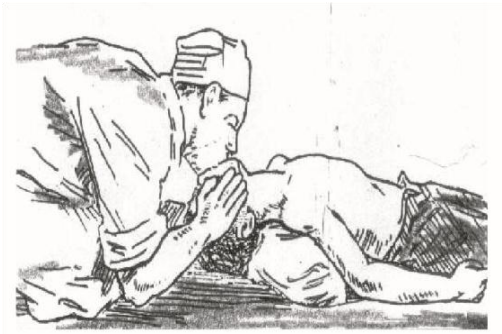

Fig. 11.3. Artificial mouth-to-mouth breathing

Fig. 11.5. Assistance to the victim by two persons

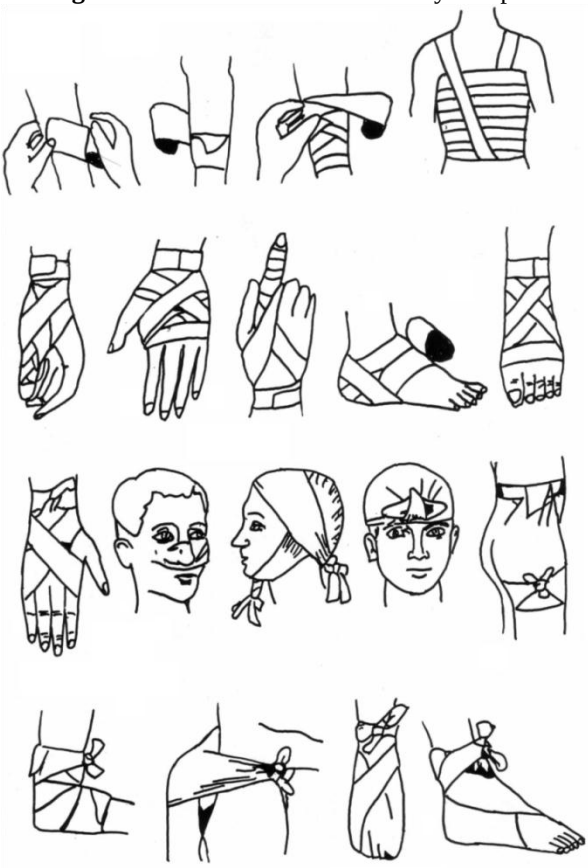

Fig. 11.6. Schemes of bandages on different parts of the body

Fig. 11.7. Shini Overlay Scheme

Loss of consciousness, trauma

Loss of consciousness (VS) is a state where a person does not respond to anything, immobile, does not answer the question.

The reasons may be different, but they are all related to the defeat of the center of consciousness – the brain (in traumas, lack of oxygen, freezing, etc.). The signs of sunshine are manifested in a wide range of symptoms, ranging from shock, fainting and ending with clinical death.

When the sun is a danger to the life of the victim is a fall of the tongue and ingress of vomiting in the respiratory tract, which leads to their blockage.

Help. First of all, the victim should be removed from the scene, then the airways should be released, and the victim should be put aside. In the case of respiratory arrest and palpitations, help with artificial respiration and closed heart massage should be initiated. A person who has lost consciousness cannot be drunk and transported in a fixed state on the side.

Nutrition consists of two basic procedures: recovery of respiration (artificial respiration) and cardiac activity (external heart massage). The caregiver should distinguish between signs of life and death. So, the heartbeat is determined by the hand or hearing on the left, below the nipple, and also on the neck where the carotid artery passes, or on the inside of the forearm. Breathing is determined by the movements of the chest, the wetting of the mirror applied to the nose of the victim, the narrowing of the pupils during the sudden lightening of the eyes or after darkening their hands. Once signs of life have been established, help should be started immediately. But even in the absence of these features, as long as there is no full certainty of the victim's death, he or she must be fully assisted. As noted, death has two phases – clinical and biological. Clinical death lasts

5–7 minutes, but there are no irreversible effects in the body. During this period, as long as there were no serious damage to the brain, heart and lungs, the body can be revived. The first signs of biological death are corneal opacities, pupil deformity during compression, cadaveric decay, cadaveric bluish spots.

Artificial respiration (BW).

The most effective way of diabetes is breathing «from the lungs to the lungs», which is performed «from mouth to mouth» or «from mouth to nose». To do this, divert the victim's head as far back as possible and with his fingers clamp his nose (or lips). They take a deep breath, press their lips against the victim's lips and quickly exhale deep into his mouth. The injection is repeated several times at a frequency of 12–20 times per minute. For hygienic purposes, it is recommended to cover the victim's mouth with a piece of thin tissue (spout, bandage, scarf, etc.). If the face is damaged and it is impossible to carry out the «lungs in the lungs» CD, the method of compressing and expanding the chest by folding and pressing the hands of the victim to the chest with their subsequent dilation should be applied.

External massage of the heart is carried out in the event of its stopping. This makes it rhythmic contraction between the sternum and the spine. On the lower part of the sternum, put the inside of the wrist with one hand, which is forcefully pressed (at a frequency of 1 time per second) laid on top with the other hand. The pressing force should be such that the sternum is compressed to a depth of 4–5 cm.

It is advisable to perform a heart massage in parallel with artificial respiration, for which after 2–3 artificial breaths they make 4–6 pressure on the chest.

Proper heart massage, when pressed on the sternum, will cause a slight pulse of the carotid artery and within a few seconds, the pupils will narrow, as well as the skin of the face and lips, and self-breathing will appear. Do not lose your vigilance, do not forget about the possibility of cardiac arrest or breathing.

When providing first aid, you must be prepared for a sudden second attack. In order not to miss it, it is necessary to monitor the pupils, skin color and breathing, regularly check the frequency and rhythm of the pulse.

Shock. The causes are severe pain, blood loss, the formation of harmful products in the damaged tissues, which lead to the depletion of the body's protective capabilities, resulting in impaired circulation, breathing, and metabolism. Signs – pallor, cold sweat, dilated pupils, short-term loss of consciousness, increased breathing and pulse, decreased blood pressure. During severe shock – vomiting, thirst, ashy complexion, blue lips, earlobes, fingertips. Occasional urination can sometimes occur.

Help. Preventing the development of shock is timely and effective assistance provided in any wound. If the shock is aggravated, help should be provided that is appropriate for the type of injury (for example, stop bleeding, immobilize fractures, etc.). Then the victim should be wrapped in a blanket, put in a horizontal position with the head slightly lowered. In the case of thirst, when there is no damage to the internal organs, drink water. Measures that prevent the onset of shock are: silence, heat (but not overheating), reducing pain, drinking.

Faint. Causes – sudden insufficiency of blood circulation of the brain under the influence of: emotional excitement, fear, pain, lack of fresh air, etc. These factors contribute to the reflex expansion of the muscle vessels, which causes the brain to bleed. Signs of sudden fainting, but sometimes it is preceded by pallor, vomiting, weakness, yawning, increased sweating. During this period, the heart rate accelerates, blood pressure decreases. During fainting, the heart rate slows to 40–50 beats per minute.

Help. The unconscious should be put on his back, slightly raise (by 15–20 cm) lower extremities to improve the circulation of the brain. Then release the neck and chest from the clothing that squeezes them, pat on the cheeks, wash the face, chest with cold water, let sniff the ammonia. If the victim begins to breathe with wheezing or there is no breathing, the tongue should fall. As a last resort, steps are taken to revive it.

Concussion . The reasons are traumatic damage to tissue and brain activity as a result of falling on the head, bruises and bruising of the head. Small hemorrhages and edema of the brain tissue may occur. Signs – Instant loss of consciousness, which may be short-lived or last several hours. Respiratory, pulse, nausea, vomiting may occur.

Help. To prevent strangulation of the victim in unconsciousness, due to the fall of the tongue or the vomiting masses, put him on the side or on the back, with the head turned sideways. Cooling compresses are put on the head, in the absence or violation of breathing, artificial resuscitation is performed. The victim should be transported immediately to a medical facility accompanied by a person who is able to provide assistance for recovery.

Bleeding. Causes – violation of the integrity of the blood vessels due to mechanical or pathological damage. Signs – arterial bleeding, which is characterized by a bright red color of blood, blood beats a fountain; during capillary hemorrhage it is secreted by drops, venous blood has a dark red color.

Help. Arterial bleeding is stopped by a compression bandage. During bleeding from a large artery to stop the flow of blood to the wound site, press the artery with a finger above the wound, and then apply a compression bandage. During bleeding from the femoral artery, a plait is placed above the

site of bleeding. A layer of gauze is placed under the harness to avoid damaging the skin and nerves, and a note stating the time of its application is inserted. The duration of the harness is limited to two hours, otherwise the limb will die. If during this period it is not possible to provide additional help, then after 1.5–2.0 hours the plait is released for a few minutes (before the redness of the skin), the bleeding is reduced in other ways (for example, with a compression swab), then again tighten the plait. When bleeding from the main cervical (carotid) artery, the wound is possibly squeezed by the finger, after which a large amount of gauze is stuffed, they do tamping.

Capillary bleeding stops well with a compression bandage, after which the skin around the wound is treated with a solution of iodine, alcohol, vodka, cologne. If a foreign object protrudes from the wound, it should be made a hole in the localization site, otherwise the object may penetrate deeper and cause complications.

Venous bleeding is much easier to stop than arterial bleeding. It is often enough to raise the limb, bend it as much as possible in the joint, and apply a compression bandage.

If the victim coughs up with bright red foamed blood – bleeding in the lungs. In this case, breathing is difficult. The patient is put in a reclining position, a roller is placed under his back, a cold compress is placed on his chest. It is forbidden to speak and move, hospitalization is required.

The bleeding of the digestive tract is characterized by vomiting of the dark red blood that has drained. The position of the victim is provided the same as during bleeding from the lungs, but the legs bend at the knees. In normal blood loss, acute anemia may develop and shock may occur.

First of all it is necessary to stop bleeding, if possible to drink tea. Then the body of the victim is given a position in which the head for normal blood supply should be slightly below the torso.

Thermal effects

Overcooling. It develops as a result of disturbance of the processes of thermoregulation during the action on the body of the cold factor and the disorder of the functions of the vital systems of the body. It is caused by fatigue, immobility. Signs – at the initial stage the victim freezes, accelerates respiration and pulse, raises blood pressure, then comes hypothermia, decreases pulse, respiration, decreases body temperature. After cessation of breathing, the heart may continue to contract for some time (from 5 to 45 minutes). As the body temperature drops to 34–32 °C, the consciousness becomes obscured, the breathing stops, and the tongue becomes unconscious.

Help. With a slight degree of hypothermia, the body is heated by rubbing, give a few glasses of warm liquid.

At moderate and severe degrees vigorously rub the body with woolen cloth to redness of the skin, give a lot of hot drink, including milk with added sugar or 100–150 g. 40 % of alcohol – rectified. If the victim is breathing poorly , artificial respiration should be initiated. After warming up the victim and restoration of vital functions, they create peace, wrap themselves in warm clothes.

Freezing. Occurs only with prolonged exposure to cold, due to the contact of the body with cold metal in the cold, with liquefied and compressed air or dry carbon dioxide, with high humidity and strong wind with not very low air temperature (even about 0°C). Fosters overall weakening of the body due to starvation, fatigue or illness. Most often, the toes and hands, as well as the nose, ears, cheeks, are frozen.

There are four stages of tissue frostbite: 1 – redness and swelling; 2 – formation of blisters; 3 – skin death and scab formation; 4 – the killing of part of the body.

Help. Rubbing and warming up at the scene. It is advisable to place the victim near a heat source (for example, by the fire) and continue grinding here. It is better to rub the frozen part with alcohol, vodka, cologne, and if they are not, then a soft mitten, fur collar. Cannot be rubbed with snow. After the appearance of pink, the frostbite is wiped dry, moistened with alcohol, vodka or cologne and insulated with cotton or cloth. Clothes and shoes from the defrosted body parts should be removed very carefully; if this is not possible, the part of the clothing or shoes that impede access to the damaged parts of the body should be knifed.

Overheating. It occurs as a result of prolonged stay in the sun without protective clothing, with physical activity in stationary moist air. Easy degree – general weakness, malaise, dizziness, nausea, increased thirst, red face, covered with sweat, pulse and breathing accelerate, body temperature 37.5–38.9 °C. Medium degree (body temperature 39.0–40.0 °C) – severe headache, sharp muscle weakness, blinking in the eyes, tinnitus, pain in the heart area, marked redness of the skin; severe sweating, bruising of the lips, acceleration of the pulse to 120–130 beats / min, frequent and superficial breathing. Heavy degrees of body overheating qualify differently: if the air temperature is high and its humidity is high, it is a heat stroke, if the sun was in action for a long time – a sun stroke. The body temperature rises above 40°C , fainting and loss of consciousness, the skin of the victim becomes dry, he begins to cramp, cardiac activity is broken, involuntary urination, breathing stops.

Help. It is necessary to put the victim in the shade or in a cool place, wash it, pour it with cool water. Put a cold compress on the head, neck, and heart area, give a cool drink, bring a cotton swab moistened with ammonia

to the nose. If cardiac arrest is severe, breathing stops, artificial respiration should be performed.

Thermal burns. They are caused by the action of high temperature (flames, hot liquid, hot objects, etc.). Depending on the severity, there are four degrees of burn: 1 – redness of the skin and its swelling; 2 – blisters filled with yellowish liquid; 3 – formation of skin necrosis (scabs); 4 – charring the fabric. With severe burns, shock occurs.

Help. It is necessary to quickly remove or remove the victim from the fire zone, immediately remove the clothing, or throw something on the victim (blanket, cloth), to stop the access of air to the fire. Flames on clothing can be extinguished with water, covered with sand, extinguished with your body (if you swing on the ground).

In degree I burns, it is necessary to wash the affected areas of the skin with antiseptic agents, then treat with alcohol-rectification. To the burned areas it is impossible to touch hands, it is impossible to pierce blisters and to tear off the pieces of clothing adhered to places of burn, it is impossible to apply ointments, powders. The baked surface is covered with a clean gauze. If the victim is freezing, he should be warmed up: shelter, drink plenty. With severe pain you can give 100–150 ml of wine or vodka. In case of loss of consciousness as a result of carbon monoxide poisoning it is necessary to smell the ammonia. If breathing is stopped, artificial respiration should be given.

Special types of injuries

Chemical burns. Occur as a result of action on the respiratory tract, skin and mucous membranes of concentrated inorganic and organic acids, alkalis, phosphorus, and other substances. Thermal chemical burns are formed during the ignition or explosion of chemicals. The depth of tissue damage chemical burns are divided into four stages: 1 – a clear reddening of the skin, slight edema, accompanied by pain and burning sensation; 2 – large edema, formation of blisters of different size and shape; 3 – darkening of the tissue or whitening after a few minutes, hours. Skin swells, sharp pains occur; 4 – deep killing of not only skin, but also subcutaneous fat, muscles, ligaments of the joints.

Acid burns are very deep, dry scab is formed at the burn site. When burns with alkaline tissue moist, so these burns are more difficult to tolerate than acid burns.

Help. If the victim's clothing has been leaked with a chemical, it must be quickly removed, cut or torn at the scene. Then mechanically remove the substances that have got on the skin, vigorously wash them with a jet of water (at least 10–15 minutes), until the specific odor disappears. If a chemical enters the respiratory tract, it is necessary to rinse the throat with

an aqueous 3 % boric acid solution, rinse the eyes with the same solution. Do not rinse off chemicals that engage or explode when combined with water. If it is not known which chemical has caused the burn, a clean dry dressing should be applied, after which an attempt should be made to remove or reduce the pain.

Electric shock. The reason is working with technical electrical means, direct contact with a conductor or current source and indirect – by induction. The alternating current is already under the voltage of 220 V causes very severe damage to the body, which is exacerbated by wet shoes and hands. Electric current causes changes in the nervous system, its irritation, paralysis, muscle spasms, burns. There may be a convulsive spasm of the diaphragm – the main respiratory muscle and heart. As a result, the heart and breathing stops.

Help. Care should be taken immediately to remove the victim from the conductor or electrical source. In the absence of consciousness, breathing, pulse, it is necessary to urgently start revitalization (artificial respiration, indirect heart massage) before fully restoring the functions of life, drink plenty of water, tea, and then wrap.

Lightning strikes. Signs similar to signs of electric shock and phenomena of electric burn.

Help. Actions similar to those of electric shock. It is impossible to bury the victim in the ground: the chest, squeezed by the ground, cannot expand, even when self-breathing occurs.

Damage to the musculoskeletal system. Occur when performing physical work, playing sports, everyday activities, falling, road accidents, etc.

When stretching and striking, muscles and ligaments overstretch. Separate fibers of tendons and muscles can be torn. There is a lot of pain, there is swelling around the joint.

Help. Cold, such as an ice or snow pouch, cloth soaked in cold water, should be applied immediately to the damaged area, then tightly bandage the joint and consult a trauma center. Ways of dressing are shown in fig. 11.6.

Dislocation. This is the output of the articular head from the articular depression. It is accompanied by a rupture of the articular pouch, ligaments and muscles.

Help. Do not adjust the joint yourself, it can rupture the vessels and nerve fibers. At dislocations first apply a cold, and then fix the joint motionless. To do this, the boards or solid objects are lined to the joint. The victim is sent to the hospital.

Fracture of bones. Violation of bone integrity. Most often there are fractures of extremity bones. Less often – skull bones, clavicle, pelvic girdle. Fractures are closed and open. Closed fractures are sometimes

difficult to diagnose. With closed fractures of the extremities there is a strong pain, the damaged place swells. Sometimes there is a change in the shape of the limb due to displacement of the broken bone.

Help. Ensure the immobility of the damaged bone. It is necessary to prevent the rupture of the circulatory, nerve fibers during its movements. For this purpose a tire is made of various solid objects (boards, sticks, etc.) (see Fig. 11.7). To prevent the tire from pushing into the fracture site, a soft cloth is placed under it. It is necessary to fix two joints (for a shoulder fix humeral, elbow and radial-wrist, and for a hip – ball, knee and ankle joints). If there is no tire, the broken arm is bandaged to the torso and the broken leg to the healthy leg.

With open fractures, the sharp ends of the broken bone tear muscles, blood vessels, nerve fibers, skin. Bleeding occurs.

Help. First of all it is necessary to stop the bleeding, close the wound with a clean bandage, and then apply a tire.

At rib fractures, the chest is tightly bandaged to limit the movements of the ribs while breathing.

Fractures of the skull and spine are very dangerous. In such cases it is better to call an ambulance and not move the victim. If this is not possible, the victim with a fractured spine should be carefully placed on the abdomen on a firm, level surface, such as a board. Put something soft under your head and shoulders to lift them. With the fracture of the skull, the victim is transferred to a stretcher, while fixing the head, as carefully as possible transported to the hospital.

Prolonged compression of the fabric. The reasons are weight loss during collapses, crushing in other situations. A few hours after the compression of the tissue develop severe general disorders, such as shock, severe swelling of the crushed limb. Urinary secretion sharply decreases, it turns brown. There are vomiting, delusions, yellowing, the victim faints and may even die.

Help. To try to release the victim from compression, to cover the affected place with ice, cold bandages, to put on the extremity a tire bandage without tightly bandaging the damaged areas of the body.

Drowning. With true (wet) drowning, the liquid necessarily enters the lungs (75–95 % of all drownings). During reflex narrowing of the glottis (dry drowning), water does not enter the lungs and the person dies from mechanical asphyxiation (5–20 % of drownings). Drowning occurs from primary cardiac arrest and breathing due to trauma, temperature shock, etc.

Drowning can result from prolonged diving, when the amount of oxygen in the body is reduced to a level that does not meet the needs of the brain. Signs – in the case of wet drowning, when the victim is rescued

immediately after immersion in the water, in the initial period after its lifting to the surface is noted inhibited or excited state, skin and surface mucous lips pale, breathing is accompanied by cough, pulse is accelerated. The upper abdomen is swollen, often vomiting of gastric contents with swallowed water. These signs can disappear quickly, but sometimes weakness, dizziness, chest pain and cough persist for several days. If the duration of the final immersion of the victim under water was not more than a few minutes and after extraction from the water he was unconscious, the skin is bluish, the foamy liquid of pink color flows from the mouth and nose, the pupils are weakly respond to the light, the jaws are tightly compressed, breathing tight , the pulse is weak, non-rhythmic, the condition of the body is characterized as in the stage of agony. When 2–4 minutes have elapsed after the patient's initial immersion, self-breathing and cardiac activity are usually absent, the pupils dilated and not responding to the light, the skin is blue. All these signs indicate the onset of clinical death.

When dry drowning skin is less pronounced, in the stage of agony there is no leakage of foamy liquid from the mouth, the duration of clinical death is 4–6 minutes.

The drowning that developed as a result of primary cardiac arrest and cardiac activity is characterized by a sharp pallor of the skin, absence of fluid in the mouth and nose, respiratory and cardiac arrest, dilation of the pupils. In such drowning, the clinical death can last up to 10–12 minutes.

Help. The drowning must be rescued quickly, because death comes 4–6 minutes after drowning. Sailing to the drowning rear, it is necessary to take it under the armpit so that the head was above the water, facing upwards, and to swim with him to the shore. Then, as soon as possible, it is necessary to clean the mouth and throat of mucus, sludge and sand, quickly remove the water from the respiratory tract – turn the victim to the abdomen, bend over the knee so that the head hangs down and repeatedly press on the back. After that the victim is turned upside down and begins to revive. When a drowning man is rescued in the initial period of drowning, it is necessary to first of all take measures to eliminate emotional stress – to remove wet clothes, dry wipe the body, calm down. If the victim is unconscious with sufficiently spontaneous breathing, he is placed horizontally, his legs are raised by 40°–50°, allowed to breathe with ammonia. At the same time the victim is warmed up, doing a chest massage, rubbing his arms and legs.

Poisoning

General poisoning . The reason is the use of stale or contaminated bacteria products. The disease usually begins 1–2 hours after ingestion of contaminated products, sometimes after 20–26 hours. Signs – malaise,

nausea, vomiting (repeated), palpable abdominal pain, frequent rare emptying, paleness, fever up to 38–40 °C, frequent weak pulse, convulsions. Vomiting and diarrhea dehydrate the body, contribute to the loss of salts.

Help. The victim is washed several times with the stomach (forced to drink 1.5–2.0 liters of water, and then cause vomiting by irritation of the root of the tongue) before the appearance of clean wash water. Then they give tea, coffee, but not food. The patient should be constantly monitored to prevent respiratory arrest and circulation.

Meadow poisoning. The reasons are respiratory tract alkaline sodium and potassium compounds. Signs – an unpleasant alkaline taste in the mouth, cough, sharp burning heartburn of the mucous membranes of the eyes and larynx, chest pain, dilation of the pupils, sharp weakness, general convulsions.

Help. Provide fresh air to the victim, relieve him / her of breathable clothing, allow sniffs to smell. If breathing is stopped, artificial respiration should be given.

Poisoning monoxide emissions

The reasons are the inhalation of carbon monoxide, generator gas, combustion products, smoke, which causes the blood to block hemoglobin from oxygen and limit the conditions for its transfer from the lungs to the tissues. Signs – skin is bright pink, dizziness, tinnitus, general weakness, nausea, vomiting, weak pulse, fainting (with mild poisoning), immobility, cramps, visual disturbance, breathing, heartbeat, loss of consciousness for an hour or even days (in severe poisoning).

Help. Similar to that provided with alkali poisoning.

Diseases associated with changes in barometric pressure

Hypoxia (oxygen starvation). The main cause of disorders of the body's activity is the reduction of oxygen tension in the blood – hypoxia. Occurs in all cases where there is a decrease in partial pressure in the respiratory environment (due to the sealing of the cabin in the mountains), as well as during inflammation of the lungs, other disorders of the lung tissue, reduction of hemoglobin due to carbon monoxide poisoning. Acute hypoxia may occur as a result of prolonged delay in breathing while diving, as a result of intense exercise. The signs appear depending on the rate of fall of the partial pressure of oxygen in the respiratory mixture.

There are four stages:

1. Increased pulmonary ventilation, acceleration of the pulse, light dizziness, increased blood pressure;

2. Relaxation of thinking, breathing and pulse are frequent, knock on the temples, dizziness. Occasionally breathing occurs (Cheyne-Stokes);

3. Blueing of the skin, confusion, nausea, vomiting, clinical convulsions, fainting;

4. Fainting, respiratory arrest may occur, after which the heart will continue to contract for some time. The lack of clear signs of oxygen starvation makes it particularly dangerous.

Help. As soon as possible provide conditions for normal breathing in the atmospheric air, if possible, allow to inhale pure oxygen. If hypoxia is accompanied by fainting and respiratory arrest, do artificial respiration, indirect heart massage. After successful implementation of resuscitation measures create peace, warm the victim.

Therefore, the described reasons, signs and actions on providing first aid to the victims in the conditions of struggle for survival hopefully play their positive role in the complex and extreme situations of the industrial sphere, as well as in everyday life. But it is important to remember that it is important to accurately identify the symptoms, decide on the action and, without wasting time, start helping, clearly adhering to the basic principles: correctness and expediency, speed, thoughtfulness, determination and calmness.

The device of artificial respiration manual portable, model 120

The apparatus is designed to restore absent or impaired breathing of the rhythmic lung in the lung due to the oxygen-enriched atmospheric air mask. Injection of maximum volume of air for one cycle not less than 1,5 l. (Fig. 11.8).

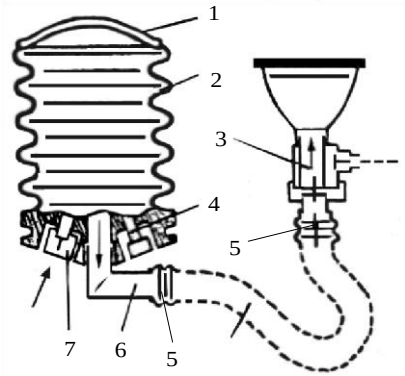

Fig. 11.8. The device for artificial respiration
1 – handle; 2 – corrugated bag; 3 – non-reversible valve;
4 – safety valve; 5 – corrugated valve; 6 – angle; 7 – air intake valve

Exhale resistance at a constant gas flow of 25 l / min – no more than 10 mm Hg (98.7 Pa). Weight of the device 2.5 kg.

The apparatus consists of a rubber corrugated bag *2*, a non-reversible valve *3*, a pressure relief valve *4*, an air intake valve from the atmosphere *7*, an oxygen supply valve and a set of elements for connecting the apparatus to the victim (patient). Rubber corrugated bag is secured between the top and bottom covers of the machine.

In the center of the lower cover of the apparatus is a conical sleeve into which a non-reversible valve is mounted directly or by means of a corner *6* and a corrugated hose *5*. Artificial respiration is performed by compressing and stretching the lining. The bag is stretched by the handle *1* secured to the top cover of the machine. During compression, the air enters the non-reversible valve and further into the victim's lungs.

The set of respiratory apparatus includes a set of breathing tubes, which allows to perform artificial respiration in a mouth-to-mouth and mouth-to-nose manner.

Preparation of the device and its operation

Before the beginning of artificial ventilation of the lungs it is necessary to open the mouth of the victim, quickly inspect it, check with the fingers the oral cavity, pharynx and entrance to the larynx. Then pick up the appropriate air hose, insert it into the mouth and fix it with a sticky patch or bandage.

Attach the mask of the desired size to the apparatus and press it firmly against the victim's face. For tightness the skin should be pre-oiled with petroleum jelly at the place of application of the mask. The aid worker places one hand on the top cover of the breathing apparatus and fixes the mask on the victim's face with the other. The injection rate for adults is 15–18, for children 2 to 10 years – 20–30 every 1 minute.

Report

The report should reflect the following issues:

1. The purpose of the work.
2. A brief description of first aid in various emergency situations.
3. First Aid Sequence Schemes.
4. Terms of use of the artificial respiration apparatus, its brief description and rules of use.
5. Date and signature of the student.

Control questions

1. What are the two main procedures for recovery?
2. How to do CPR?
3. How to do an external heart massage?
4. What assistance is provided in a state of shock?
5. What help is rendered unconscious?

6. What help is provided in a concussion?
7. What assistance is provided in losing consciousness?
8. What assistance is provided during bleeding?
9. What assistance is provided in the thermal impact state?
10. What assistance is provided in a chemical burn state?
11. What assistance is provided in a condition of electric shock?
12. What assistance is provided in the state of poisoning?
13. What assistance is provided in the condition of special types of injuries?
14. How is the artificial respiration apparatus designed and operated?
15. How to prepare artificial respiration apparatus?
16. How is an artificial respiration apparatus attached to a victim?

ADD-ONS

Appendix 1

Questionnaire

1. Do you experience differences in different seasons (yes / no) in:
a) well-being ___ 20;
b) mood ___ 5;
c) working capacity ___ 10;
d) health status ___ 20.

2. Do you notice any changes (yes / no) to the weather:
a) well-being ___ 20;
b) working capacity ___ 10;
c) mood ___ 5.

3. What is the effect of (yes / no) «bad» weather:
a) weaknesses ___ 10;
b) drowsiness ___ 5;
c) bad mood ___ 5;
d) headache ___ 15;
e) dizziness ___ 25;
e) other ailments (which) ___ 20.

4. What is the weather that has the greatest impact on you (yes / no):
a) rain ___ 10
b) windy ___ 10;
d) frying ___ 10;
e) cold ___ 10;
e) dry ___ 10;
w) with high humidity ___ 10;
h) other ___ 10.

5. Do you feel any future changes in the weather (need not be crossed out):
a) yes ___ 20;
b) no ___ 0.

Appendix 2
to the Order of Investigation and Accident Account
non-productive cases

Sample

NOTIFICATION OF A NON-PRODUCTION ACCIDENT

«___» _____ 20 ___ years

Medical-preventive institution where the victim addressed or delivered

_____

The message was sent _____

(name of the district state administration or executive body city, district in the city council,

_____

body of internal affairs, prosecutor's office, state market surveillance authority)

Last name, surname and patronymic of the victim _____

_____

Date of birth _____

Occupation _____

Address of the victim

_____

(Autonomous Republic of Crimea, region, district, settlement, street, house, apartment)

_____

The place where the accident occurred and the circumstances in which the accident occurred _____

_____

Date and time of injury _____

_____

(number, month, year, hour)

Date and time of referral to the health care facility _____

_____

(number, month, year, hour)

Diagnosis _____

Type of trauma according to the International Classification of Disease (MKH-10) codes _____

The event that led to the accident _____

_____

Conclusion on the presence of alcohol or drug intoxication _____

_____

_____	_____	_____
(position of medical officer)	*(signature)*	*(initials and surnames)*

Appendix 3
to the Investigation Procedure
and accounting for non-productive accidents

Form NT

APPROVED

_____
(position, initials and surname)

_____
(signature)

«___» _____ 20 ___

ACT N ____ on a non-productive accident

1. _____
(surname, last name and patronymic of the victim)

2. Date of birth _____ _____ _____
number *month* *year*

3. Sex _____

4. Occupation: working, non-working, preschool child age, student, student ___
_____

5. Date and time of the accident
numeric _____
month _____
year _____
hours _____
minutes _____

6. Address of the victim:
Autonomous Republic of Crimea, region _____
area _____
settlement _____
street, house, apartment _____

7. Place where the accident occurred _____
_____

8. Brief description of the circumstances of the accident _____
_____

9. The event that led to the accident _____

10. Causes of an accident _____

11. Consequences of an accident _____ _____
deadly *not deadly*

12. Staying the victim in a state of alcohol or drug intoxication, sober _____
_____

13. Measures to be taken to eliminate the causes of injury:

N p / n	Contents of the event	Artist – position, place of work, initials and last name	Deadline

14. Conclusion of the commission _____
(content of violation of legal acts with indication of guilty persons)
_____
_____

15. Name of the organizing organization investigation

Head of Commission _____ _____ _____
(position) *(signature)* *(initials and surnames)*

Members of the commission _____ _____ _____
(position) *(signature)* *(initials and surnames)*

_____ _____ _____
(position) *(signature)* *(initials and surnames)*

«___» _____ 20 ___ years

Appendix 4

EXPLANATION

to the completion of the act in the form of NT on the accident of non-productive nature

The act consists of text and code parts, which are filled in accordance with generally accepted (established) terms, cross-sectoral and specially developed classifiers.

The codes should be entered in the rectangles to the right of the sheet.

Acts in the form of NTs, which are drawn up in the event of a fatal accident, are subject to codification.

Item. Indicate the number, month and year of birth, and in the rectangle the age of the victim (number of full years) at the time of the accident.

Example:

45 years and 5 months –	45

Item. Gender: 310 – male, 320 – female.

Item. Occupation: 410 – working, 420 – non-working, 430 – child of preschool age, 440 – student, 450 – student.

Example:

Working –	410

Ite5. In the first line, the number and month are indicated by their ordinal numbers and the year by the last two digits.

Example:

December 1, 2000 –	0	1	1	2	0	0

The second line indicates the time when the accident occurred.

Example:

12 years 20 minutes –	1	2	2	0

Item. To be completed in accordance with the Classifier of Objects of Administrative and Territorial System of Ukraine (KOATUU).

Item. To be completed in accordance with the Event Classifier specified in Appendix 6.

Item. To be completed in accordance with the Event Classifier that led to the accident specified in Appendix 4.

Item. To be completed in accordance with the Classifier of causes of accidents specified in Appendix 5. The rectangle shall indicate the main cause of the accident.

Clause 11. In case of death of the victim it is stated -	

Item. Stay of the victim in a state of alcohol intoxication – 121, narcotic – 122, sober – 123.

Recording is made on the basis of the conclusion drawn by the doctor who conducted the examination of the victim.

Item. To be completed in accordance with the general cross-sectoral classifier «System of designation of public authorities» (SPODU) or the general cross-industry classifier «Unified State Register of Enterprises and Organizations of Ukraine» (EDRPOU).

Appendix 5
to the Procedure for Investigation and
Accounting of Non-Productive Accidents

CLASSIFIER of events leading to a non-productive accident

Code	
1000	**Events related to transport, including:**
1001	entrance, exit from the vehicle (car, bus, train, subway, trolley, cable car, etc.)
1002	road accidents, of them
1003	collision or collision of vehicles (cars, motorcycles and bicycles, urban electric vehicles, trains)
1004	other adventures related to road construction, agricultural machinery and more
1100	**Events related to the use of gas in the home**
1200	**Accidental falls of the victim, including:**
1201	while moving
1202	from a height
1203	in wells, pits, tanks, etc.
1300	**Random action of mechanical forces, including:**
1301	fall, collapse of objects, materials, rocks, etc.
1302	demolition of buildings, structures and their elements
1400	**The action of objects and moving parts rotate and fly away**
1500	**Electric shocks, including:**
1501	in case of contact with the transmission line and broken wires
1502	in the case of power supply facilities
1503	when using household appliances
1600	**Explosions, including:**
1601	ammunition, explosive materials
1700	**Exposure to extreme temperatures (other than fires) leading to burns, heatstroke or frostbite**
1800	**Fire**
1900	**Accidental poisoning, including:**
1901	food and non-alcoholic beverages
1902	alcoholic beverages
1903	narcotics, psychotropic substances and precursors
1904	mushrooms
1905	medicines and medications
1906	other chemicals and poisonous substances
2000	**The action of ionizing, radioactive, electromagnetic radiation**
2100	**Suicide, self-harm**
2200	**Starvation, exhaustion**
2300	**Drowning**
2400	**Killing or injuring another person**
2500	**Use or contact with firearms**
2600	**Contacts with animals, insects, poisonous plants and other fauna and flora**
2700	**Man-made and natural disasters, action of forces of nature**
2800	**Others**

Appendix 6
to the Procedure for Investigation and
Accounting of Non-Productive Accidents

CLASSIFIER of the causes of the accident

Code	
100	**Design flaws, imperfections, lack of reliability, including:**
101	household appliances and appliances
102	vehicles
110	**Poor technical condition, including:**
111	vehicles
112	household appliances and household appliances
113	structures, buildings, structures
114	roads, passages, passages and more
120	**Absence or shortcomings of documentation on the operation or use of household appliances, equipment, objects, substances, etc.**
130	**Violation or non-compliance with security rules and regulations, including:**
131	traffic rules
132	fire safety rules
133	safety requirements during the operation of technical equipment, equipment, household appliances
140	**Violation or non-observance of sanitary norms and requirements, personal hygiene, including:**
141	sales of low-quality, dangerous and counterfeit goods
142	consumption of substandard food, drinks, mushrooms
150	**Absence of alarm systems, alarms, ventilation, protective devices, fences**
160	**Insufficient public awareness**
170	**Personal carelessness**
180	**Unsatisfactory psychophysiological state, being in a state of alcoholic, narcotic intoxication, toxicological poisoning**
190	**The wrongful acts of others**
200	**Others**

Appendix 7
to the Procedure for Investigation
and Accounting of Non-Productive Accidents

Event Classifier

Code	
10	Educational institution (kindergarten, school, boarding school, college, institute, etc.)
11	Office building and more
12	Treatment facility or donor center
13	Amusement or sports facility (cinema, theater, stadium, swimming pool, zoo, etc.)
14	Place of organized rest (sanatorium, dispensary, home and recreation center, attraction, park, organized beach, sports and wellness camp, tourist and recreation center, etc.)
15	Sports facilities (stadium, gym, football field, ice skating rink, equestrian center, sports ground, etc.)
16	Shopping (market, shop) or catering (restaurant, cafe, dining room, etc.)
17	Place of unorganized rest and tourism (forest, river, unorganized beach, mountains, caves, etc.)
18	Housing (apartment, house, cottage, home and business premises, etc.)
19	Special location (hostel, hospital, hospital, orphanage, nursing home, shelter, etc.)
20	Cottage, garden and garden, garden, garage
21	Road, street, sidewalk, footpath, stairs
22	Vehicles (bus, tram, subway, etc.)
23	Elevator at home
24	Other places

Appendix 8
to the Procedure for Investigation
and Accounting of Non-Productive Accidents

REPORT on accidents outside work
by _____ 20_____

_____
(name of health care facility, local executive body or local self-government body),

_____

_____

Code according to the International Statistical Classification of Diseases and Related Health Issues of the tenth revision	**Name**	**Total accidents**	**The victims**		**Group accidents**				**Accidents with children under 14 years**	
			total	including with smertel-force of	total	of all the victims	including with smertel- force of	total	of all the victims	including with smertel- force of
V01-V99	Transport accidents									
W00-W19	Fall									
W20-W49	Random action of non-living mechanical forces									
W5 0-W64	Influence of living mechanical forces									
W65-W74	Accidental drowning and immersion in water									
W75-W84	Other respiratory hazards									
W85-W99	Accidents caused by electric shock, radiation, temperature or pressure									

Appendix 9

SCHEME-ALGORITHM
(example)

Non-productive accident investigation and procedure for investigation materials

adverse conditions → injury
↓
treatment of trauma center ← Sokolova O. I.
↓
receiving a hospital letter
↓
appeal to management enterprises
↓
order to form a commission
↓
hearing a case by a commission ← hearing a hospital letter
↓
the conclusions of the commission
↓
registration of the act of NT
↓
registration of documents on the enterprise for payment of l / l

Participants in the review of the accident situation with the technical editor of the publishing house «Progress» Sokolova O. I. when returning home from work.

Victim
Technical Editor: Sokolova O. I.

Witnesses to the accident
Art editor: Nosova E. V.
Head of department: Sazonov D. I.
Goal. editor: Gorin P. V.
Proforg (or authorized by the labor collective): Pavlyuk V. V.

Appendix 10
Participants in the review of the accident situation
with the technical editor of the publishing house «Progress»
Sokolova O. I. when returning home from work.

Victim

Technical Editor: Sokolova O. I.

Witnesses to the accident

Art editor: Nosova E. V.
Head of department: Sazonov D. I.
Goal. editor: Gorin P. V.
Proforg (or authorized by the labor collective): Pavlyuk V. V.

Appendix 11
Written decision to investigate a non-productive accident
from the Livadia State Administration of Yalta.
Head of the Livadia Regional State Administration

Director of Atlas Publishing House

stamp located at:

Yalta, st. Peace, building. 10, Zhoglo I. I.

MESSAGE

By decision # 18 of December 12, 2007, the Livadia Regional State Administration of Yalta obliges the director of Atlas publishing house Zhoglo I. I. to investigate an accident of a non-productive nature that occurred with the technical editor of the publishing house Sakal O. I. Prove the results in accordance with the provisions.

_____ _____
Date *Signed*

Appendix 12
by AP lines investigation and accounting
for accidents non-productive in nature Reporting
an accident non-productive in nature
12 December 2007 years

Treatment-and-prophylactic institution where the victim addressed or delivered:

Yalta city, trauma center № 5.

The message was sent by the Livadiyas Regional State Administration of Yalta.

Name, surname and patronymic of the victim: Sakal Olena Ivanovna.

Birthdate: 19 85 years, February 10.

Occupation: Technical Editor of Atlas Publishing House.

Address of the victim's residence: Yalta, str. Kyyivska, d. 13, apt. 3.

The accident scene: near the Yalta supermarket.

Injury date and time: December 21, 2001, 5 h 05 min.

Date and time of treatment referral: 1 December 210 h 15 min

Diagnosis: – damage to the ankle joint of the left leg.

Type of trauma according to the International Classification of Diseases (MKH-10) codes:

The event that led to the accident: ice, carelessness of the victim

Conclusion on the presence of alcohol or drug intoxication: (absent)

_____	_____	_____
(medical office worker)	*pidpy*	*(initsyaly and surname)*

Appendix 13

Written decision to investigate a non-productive accident from the Livadia State Administration of Yalta Head of the Livadia Regional State Administration

Director of Atlas Publishing House

stamp located at:

Yalta, st. Peace, building. 10, Zhoglo I. I.

MESSAGE

By Decision # 18 of 12.12.2007, the Livadia Regional State Administration of Yalta obliges the director of Atlas Publishing House Zhoglo I. I. to investigate an accident of a non-productive nature that happened with the technical editor of the publishing house Sakal O. I. Prove the results in accordance with the provisions.

_____ _____

Date *Signed*

Appendix 14

Order # 15 of 12/15/2007

«About creation of the commission
to investigate the unfortunate
the case of Sakal O. I.»

(date) after the termination of work, as a result of falling on the sidewalk, the technical editor of the production department of the editorial department of Atlas publishing house Sakal O. I. was injured.

To investigate the accident when returning home

ORDER:

1. To create a commission to investigate the accident of non-productive nature, which happened with the technical editor of the editorial department of the publishing house «Atlas» Sakal O. I. (date, time) as follows:

Head of department Kuts S. O. – head of Commission.

Commission members: Mr. olovnyy editor Gorin P. V., trade-union Pavlyuk V.

Chairman of the Commission investigation materials submitted for approval to 0 3.01.200 8 g. The director of the publishing house «Atlas».

Zhoglo I. I. _____

(date, signature)

Appendix 15

MINUTES No. 1
Accident Investigation Committee meeting
non-productive in nature since 13.12.2007

Composition of the commission:
Head of Department – Kuts S. O.
Goal. Editor – Yashin P. V.
Proforg – V. V. Pavlyuk
Listened to:

Message from the chairman of the commission on the execution of the accident order with the technical editor Sakal O. I., which happened on December 11, 2007 at 5 pm on returning from work. 12/12/2007 Sakal O. I. did not go to work. She called the head of department Kuts S. O. and reported that she returned home from work yesterday and fell and injured her leg. In the trauma center she was opened a hospital leaf with a diagnosis of a clogged site of the ankle joint of her left leg.

The commission now has a copy of the notification of the accident and the decision of the Livadia State Administration.

Commission decisions:

1. Yashin P. V. and Paul ove V. V. – take explanatory notes from the victim.
2. With Sacal O. I. – to take the conclusion of the hospital about the gravity of the case;
3. Conduct a survey witness Sitnik T. C .
4. Submitted materials to be submitted to the next commission meeting.

Chairman of the Commission	S. Kuts
The members of the commission	P. V. Yashin
Proforg	V. V. Pavlov

Appendix 16

«The conclusion about the severity of the injury
Yalta Emergency Station No. 5»

(stamp)

December 12, 2007 at 10 h 15 min trauma center № 5 of Yalta addressed the victim.

Sakal OI, 22 years old, residing at: Yalta, ul. Kiev, building. 13, apt. 3.

Place of work: Yalta, st. Mir, 10, Atlas Publishing House.

DS hamstring in left ankle joint.

Head. trauma center: _____
signature

Doctor: _____
signature

Appendix 17

Explanatory note

to the hospital letter No. 113 issued by trauma center No. 5, Yalta
technical editor of Atlas, Yalta, Sakal O. I.

I, Sakal O. I., returning home from work on December 11, 2007 at 5 pm near the Yalta supermarket, slipped, fell and injured my left leg. A nearby employee (art editor Sytnik T. S.) helped me get up and brought me home. At night the leg became very ill, there was an ankle swelling and on December 12 at 10 h 15 min in the morning I had to go to the trauma center No. 5 at the place of residence, where an x-ray was taken, l / l was opened with a diagnosis of a hamstring of the ankle and prescribed treatment .

Date of signature

Appendix 18

PROTOCOL

conversations with art editor Sytnik TS, witness of the unfortunate case on December 11, 2007

The interview was held (date) in the office of the head of department Kuts S. O. in the presence of Chap. editor Yashin P. V. and pro forma Pavlova V. V.

Question: When was the date with the technical editor Sakal O. I.?

Answer: An accident with Sakal O. I. happened on (the date) when we got home.

Q: Where did the N / A happen?

Answer: It happened near the publishing house near the Yalta supermarket.

Question: What did you do after Sakal O. I. fell?

Answer: I helped get up and brought her home because it was difficult for her to get on a broken leg.

Question: What caused the N / A?

Answer: Adverse weather conditions and personal negligence of the victim.

Date Signed

Appendix 19

MINUTES No. 2

Accident Investigation Committee meeting
non-productive in nature since 18.12.2007

Composition of the commission:	
Head of department	Kuts S. O.
Goal. editor	Yashin P. V.
Union leader	Paul OJ. V.

Listened to:

Message from the head of the commission on the execution of the accident order with the technical editor Sakal O. I., which occurred on 1 December 2001 at 5 pm upon returning from work. The commission has at its disposal a copy of the notification of the accident, the decision of the Livadia district state administration, an explanatory note of the victim, the protocol of the witness testimony Sytnik T. S., the conclusion about the severity of the trauma center number 5 in Yalta.

Commission decisions:

To consider an accident with a technical editor Sakal O. I. is non-productive and it should draw up a statement in the form of HT and submit it for approval to the Director of the publishing house «Atlas» Zhohlo I. I.

Chairman of the Commission	S. Kuts
Members of the Commission	P. V. Yashin
	V.V. Pavlov

Appendix 20

Test 1

1. Would you exceed the set speed to provide the necessary medical care to a seriously ill person as soon as possible?
2. Would you agree to take part in a dangerous and long expedition for good money?
3. Would you embark on the path of a dangerous fleeing criminal?
4. Could you ride on the foot of a freight car at a speed of more than 100 km / h?
5. Can you work normally after a sleepless night?
6. Would you be the first to cross a very cold river?
7. Would you lend a friend a large sum of money without being quite sure that he would be able to return the money to you?
8. Would you come in with a tidy cage with a lion to assure you it's safe?
9. Could you, under the supervision of a supervisor, climb a tall factory pipe?
10. Could you manage a sailboat without training without training?
11. Would you risk grabbing the bridle of a running horse?
12. Could you ride a bike after 10 mugs of beer?
13. Could you parachute jump?
14. Could you, if necessary, travel without a ticket from Kharkiv to Kiev?
15. Could you do a self-guided tour if your acquaintance, who recently got into a traffic accident, was driving?
16. Could you jump from a 10-meter height onto the awning of the fire brigade?
17. Could you go to a life-threatening surgery to get rid of bed rest?
18. Could you jump off the foot of a freight wagon traveling at 50 km / h?
19. Could you and seven other people climb a five-person elevator?
20. Could you go with a blindfold for a great monetary reward for a busy street intersection?
21. Would you take a life-threatening job if you paid well for it?
22. Could you, after 10 glasses of vodka, perform important calculations for you?
23. Could your boss, at the behest of your boss, take the high-voltage wire if he assured you that the wire was off?
24. After some preliminary explanations, could you control the helicopter?
25. Could you having a ticket, but no money and products that go from Kyiv to Lviv?

Test 2

1. If there is a choice between the two options, it is better to make it immediately rather than delay it for a while.
2. I'm easily annoyed if I notice that I can't do the job 100 % at all.
3. If I work, it looks like I'm putting everything on the map.
4. If a problem situation arises, I most often make a decision one of the last.
5. If I have no business for two consecutive days, I lose my composure.
6. On some days my successes are below average.
7. I am more demanding of myself than of others.
8. I'm kinder than others.
9. If I give up a difficult task, then I strongly condemn myself because I know that I would succeed in it.
10. In the process of work, I need small breaks for rest.
11. Thoroughness is not my main feature.
12. My work achievements are not always the same.
13. I am more attracted to other work than the one I do.
14. Condemnation stimulates me more than praise.
15. I know that my friends consider me a business person.
16. Obstacles make my decisions even tougher.
17. It is easy for me to awaken ambition.
18. If I work uninspired, it's usually noticeable.
19. When doing work, I do not count on the help of others.
20. Sometimes I postpone what I had to do now.
21. You should rely solely on yourself.
22. There are few things more important in life than money.
23. Whenever I need to accomplish an important task, I think nothing else.
24. I am less ambitious than many others.
25. At the end of my vacation, I usually look forward to going to work soon.
26. If I am committed to work, I do it better and better than others.
27. It is easier and easier for me to communicate with people who can work hard.
28. If I have no business, I feel awkward.
29. I have to do responsible work more often than others.
30. If I have to make a decision, I try to do it as best I can.
31. Some of my friends find me lazy.
32. My successes depend, to a certain extent, on my comrades.
33. It is foolish to oppose the will of the leader.
34. Sometimes you don't know what work to do.
35. If something goes wrong, I'm impatient.

36. I usually pay little attention to my achievements.
37. When I work with others, my work produces better results than my colleagues.
38. I do not finish much of what I undertake.
39. I envy people who are not very busy.
40. I do not envy those who seek power and high office.
41. If I am convinced that I am on the right track, I am ready for extraordinary measures to prove my point.

Appendix 22

Test 3

No points	and	b	in
1	Bold	Vigilant	Adventurous
2	Gentle	Timid	Stubborn
3	Careful	Decisive	Pessimistic
4	Unstable	Cavalier	Attentive
5	Unreasonable	Cowardly	The one who does not think
6	Nimble	Brisk	Prudent
7	Cold-blooded	Fluctuating	Dashing
8	Rapid	Frivolous	Timid
9	The one that does not think	Organized	Unpredictable
10	Optimistic	Conscientious	Sensitive
11	Melancholic	Which is doubtful	Vacillating
12	Cowardly	Careless	Agitated
13	Imprudent	Quiet	Timid
14	Attentive	Unreasonable	Bold
15	Prudent	Fast	Courageous
16	Adventurous	Careful	Provident
17	Agitated	Dispersed	Timid
18	Cowardly	Unwary	Cavalier
19	Shy	Indecisive	Nervous
20	Executive	Devoted	Adventure
21	Prudent	Brisk	Desperate
22	Confused	Indifferent	Careless
23	Careful	Carefree	Patient
24	Clever	Caring	Brave
25	Careful	Fearless	Conscientious
26	Hurried	Shy	Carefree
27	Dispersed	Imprudent	Pessimistic
28	Careful	Prudent	Adventurous
29	Quiet	Disorganized	Timid
30	Optimistic	Vigilant	Carefree

Appendix 23

TASK
for the calculation of individual risk

OPTION 1

To determine the risk of injury to a person at work in Ukraine in 1996, if it is known that as a whole, 65 thousand people were injured in the national economy, and the number of employees is 15 million.

OPTION 2

To determine the risk of death of a person in production in Ukraine, if it is known that in 1996, as a result of accidents at work, 1.9 thousand people were killed. The number of employees is 15 million people.

OPTION 3

Annually in Ukraine about 127,5 thousand people are killed as a result of various dangers. Taking a population of 50,000,000 people to determine the risk of living in the country.

To compare the obtained data with the risk of human habitation in the former USSR, if it is known that about 500 thousand people were killed as a result of various hazards. With a population of 300 million people.

OPTION 4

To determine the tendency in the amount of risk of living of a person in Kharkiv region, if it is known that in 1997, 5 279 people were fatally injured as a result of non-industrial injuries, and in 1998 – 4 742 people, with the total number of residents in the region of 3 million people.

OPTION 5

To determine the individual risk associated with traffic accidents in the Kharkiv region, if it is known that in 1998, 359 people died in an accident. With the total population in the region of 3 million people.

OPTION 6

To compare the individual risk of electrocution among residents in the Kharkiv region, taking into account the population of the region of 3 million people, if it is known that in 1997 97 people died and in 1998 – 46 people.

OPTION 7

To determine the risk of death in a year from accidents related to the operation of vehicles, if 63 thousand people were killed annually in the former USSR. The population of the USSR was 300 million people.

OPTION 8

To determine the risk of death of a person in a year from industrial accidents if 287 thousand people were killed annually in the former USSR. The population of the USSR was 300 million people.

OPTION 9

To determine the risk of death of a person in a year from industrial accidents in the Russian Federation, if it is known that in 1990, 8.2 thousand people died. Number of employees in the production of 25 million people.

OPTION 10

To determine the risk of human death in production for a year in the world, if it is known that 200,000 people die in the world annually. The number of employees in the production of 2.4 billion people.

OPTION 11

To determine the individual risk caused by poisoning, if it is known that in the Kharkiv region as a result of poisoning in 1996 suffered 1 120 people. With a total population of 2,997.9 thousand people.

OPTION 12

Determine the individual risk of injury to a person in Kharkiv as a result of a fall, considering that 10 thousand people are injured each year. With the total population of the city 1,510 million people.

OPTION 13

Determine the risk of human death in manufacturing in 1989 in the former USSR, if it is known that in 1989 killed 14.5 thousand people, the number of workers in the production of 138 million people.

OPTION 14

To determine the risk of death of a person for a year in manufacturing in mechanical engineering, if it is known that in 1990 killed 400 people. With the total number of employees 2.3 million people.

OPTION 15

To determine the individual risk of injury to a person in the former USSR in production, if it is known that in 1990, 677 thousand people were injured, the number of manufacturing workers is 138 million.

OPTION 16

Determine the individual risk of injury to a person in a machine-building industry if it is known that 58.6 thousand people were injured in 1990. With the total number of employees 2.3 million people.

OPTION 17

To determine the risk of injury to a person in the former USSR while operating vehicles, if it is known that in 1990, 350,000 people were injured. With a total population of 300 million people. OPTION 18

Determine the individual risk associated with occupational diseases, taking into account that in the United States in 1991 received 400,000 occupational diseases. With the total number of employees 120 million people.

OPTION 19

Determine the individual risk of becoming disabled at work in the former USSR, if it is known that in 1990 about 25 thousand workers became disabled at work. Number of employees in the production of 138 million people.

OPTION 20

Determine the risk of human death from environmental diseases if it is known that 1.6 million people die annually from environmental diseases on the globe. With a total population of 6 billion people.

OPTION 21

To determine the individual risk caused by poisoning, if it is known that the number of poisonings with lethal end at work and in everyday life in 1990 in the former USSR reached 50 thousand with a total population of 300 million people.

OPTION 22

To determine the risk of death and injury to a person in a fire, if it is known that during the fires in the former USSR in 1990, 8.5 thousand people were killed, more than 10 thousand people were injured. With the total population of the country 300 million people.

OPTION 23

To determine the risk of death and injury to man due to natural phenomena, if it is known that natural phenomena in 1991 led to the death of 250 thousand people. and threatened the lives of about 25 million people. With the total population of the globe 6 billion people.

OPTION 24

To determine the risk of human deaths due to earthquakes in the world, if it is known that in 1990 more than 52 thousand people were killed as a result of earthquakes in the world. With a total population of 4.8 billion people.

OPTION 25

To determine the risk of death of a person in a fire in Ukraine and in the Kharkiv region, if it is known that during the fires in 1996 1,200 people were killed in Ukraine, in the Kharkiv region 149 people. With a population of 2,997,9 thousand in the Kharkiv region, and a population of Ukraine – 49,3 million.

OPTION 26

To determine the individual risk of human injury in Kharkiv due to fires, if it is known that in 1998 85 people were injured. With the total population of 1.51 million people.

OPTION 27

To determine the risk of personal injury in the Kharkiv region at work, if it is known that in 1998, 1388 people were injured. With the total number of employees 1 million people.

OPTION 28

Determine the individual risk for resident A. living in N with a population of 1.51 million. Statistics for 10 years show that during this time, 60,000 people were killed and 120,000 people were injured.

The resident of the city N 40 hours a week works in the city, 4 weeks a year goes on vacation, 3 weeks every year he goes on business trips, 56 days a year works in the country, and the rest of the time is in the city.

OPTION 29

Determine the individual risk for a resident of A. living in a village with 200 residents. From among the villagers for 10 years 5 people. 50 people were killed. Were injured.

The resident A. works 40 hours a week in the nearest town N, leaves the village for vacations 4 weeks a year, goes on business trips for 2 weeks each year, works for the country for 56 days a year, and remains in the village for the rest of his time.

Appendix 24

Questionnaire # 1
to determine human chronotype

N p/n	Question	Answer	Score, points
1	You had to go to bed 4 hours later than usual. The duration of your sleep does not limit anything. Will you be able to wake up later than always and for how long?	a) I will not be able to wake up as usual b) wake up later in the hour c) wake up later for 2 hours d) wake up later for 3 hours e) wake up later for 4 hours	1 2 3 4 5
2	During the week you went to bed and woke up when you wanted. How long does it take to get to bed at 11am now?	a) 10 minutes or even less b) 15 minutes c) half an hour d) about an hour e) about an hour	1 2 3 4 5
3	If, for a long time, you will go to bed at 11pm and wake up at 7am, what will be the dynamics of your physical activity?	a) with the evening peak b) daytime peak c) with morning and evening peaks d) with morning-peak e) with morning peak	1 2 3 4 5
4	Imagine being on a desert island. You have a clock. When would you like your island to shine?	a) at 9 am or later b) between 6.30am and 6.50am c) between 6.30am and 7am d) between 7 and 7.10 in the morning e) after 7.10 in the morning	1 2 3 4 5
5	During the week you lie down and wake up at your discretion. Tomorrow we would like to wake up at 7am. Wake you up to no one. What time do you wake up?	a) before 6.30 in the morning b) between 6.30am and 6.50am c) between 6.30am and 7am d) between 7 and 7.10 in the morning e) after 7.10 in the morning	1 2 3 4 5
6	Every day for 3 hours you have a difficult task to do (it takes all your stress and attention). What hours would you choose for this job?	a) from 8 to 10 am b) from 9 am to 12 noon c) from 10 am to 1 pm d) from 11 am to 2 pm e) from 12 am to 3 pm	1 2 3 4 5
7	If you do not sleep at the usual time when you feel exhausted (lethargy, drowsiness)?	a) only after bedtime b) after sleep and after dinner c) in the afternoon d) after lunch and at bedtime e) just before bed	1 2 3 4 5
8	When can you sleep for as long as you want, at what hour do you wake up?	a) at 11:00 or later b) at 10:00 c) at 9:00 d) at 8:00 e) 7:00 or earlier	1 2 3 4 5

Appendix 25

Questionnaire # 2 on the wake-wake cycle study

№ p/n	Question	Answer
1	Are you always sure to wake up in the morning on time?	Yes, almost always. No.
2	If you wake up early on weekdays, do you also wake up early on weekends?	So early. No.
3	Do you rarely wake up with the unpleasant thought of getting up?	Yes, it is very rare. No.
4	Do you often feel more alert in the evening than in the afternoon?	So often. No.
5	Do you rarely want to sleep late at night?	Yes, rarely. No.
6	If the job is interesting, do you agree to work at night and rest during the day?	Yes, love. No.
7	Do you easily shift your sleep time to earlier or later times?	Yes, it's easy. No.
8	If you are lacking sleep, does it have a bad effect on your well-being?	Yes, weak. No.
9	Can you replace the lack of nighttime sleep with afternoon naps?	Yes of course. No.
10	If you lie down in the afternoon, will you be able to fall asleep quickly?	Yes, I can. No.
11	Is it easy for you to fall asleep easily after the excitement and experience?	It happens. No.
12	Do you usually sleep at night as being killed?	Yes of course. No.
13	If you wake up early in the morning, can you easily fall back to sleep?	Yes, I can do without problems. No.

Appendix 26

Form №3 Research series features sleeping-waking, related to human nature

No test	Test	Answer
1	I can be indifferent to the remarks and cautions	Yes No
2	The little things rarely upset me	Yes No
3	I am quite satisfied with the state of my affairs	Yes No
4	It's easy for me to hold myself	Yes No
5	I always try to put an end to any initiated case	Yes No
6	I am at risk	Yes No
7	In business, I love accuracy and order	Yes No
8	I trust the mind more than the feelings	Yes No
9	I solve my problems firmly and decisively, but with reason	Yes No
10	In a nice company, I like to be the center of attention	Yes No
11	I try to be all on my own	Yes No
12	I often act on the principle of «may be lucky»	Yes No
13	I am prone to self-reproach	Yes No
14	I am stubborn and capricious	Yes No
15	It is very difficult for me to stay, albeit briefly, without a job	Yes No
16	I am constantly worried about one thing and the other	Yes No
17	It is very difficult for me to hold back my desires	Yes No
18	When communicating with people, I often get frustrated	Yes No
19	Often the norms of behavior seem conditional	Yes No
20	I love when they talk to me politely	Yes No
21	Sometimes I am very excited, but there is nothing I can do	Yes No
22	Communicating with people rarely gives me pleasure	Yes No
23	I often feel insecure when I do something	Yes No
24	I am very concerned about the possible consequences of my actions	Yes No

Educational Publication

Lilia Yakivna
MUNTYAN

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