## MINISTRY OF HEALTH OF THE REPUBLIC OF MOLDOVA

## STATE UNIVERSITY OF MEDICINE AND PHARMACY NICOLAE TESTEMIŢANU

## NOTEBOOK

## FOR PRACTICAL WORK HYGIENE

of the student of the y	veargroup	
the faculty		
	(name, first name)	
Professor		according

Approved by the Quality Management Council, *Nicolae Testemițanu* State University of Medicine and Pharmacy, minutes No. 01 of 28.10.2022

### THE WORKBOOK FOR PRACTICAL IN HYGIENE is developed by

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Elena Ciobanu, PhD, associate professor,

having the main goal to facilitate the knowledge acquisition in accordance with the study plans.

#### References:

Ion Bahnarel, PhD, university professor Alexei Chirlici, PhD, associate professor

Translated by: Rusu Radu, assistant professor

The notebook corresponds to the subject of the study program of the students of the Medicine faculty and it is a technical guide for carrying out the hygienic research provided by the study plan.

The material is published in the author's edition

### DESCRIEREA CIP A CAMEREI NAȚIONALE A CĂRȚII DIN REPUBLICA MOLDOVA

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## THEME: Studying individual nutrition

## The purpose of the work:

- ✓ appreciation of compliance with the energy balance;
- ✓ determination of the daily caloric intake and the correction duration, necessary for body mass correction.

1.	determining the ideal-theoretical body mass (ITBW), the formula proposed by Britman : ITBW = height (cm) $\times$ 0.7-50 (kg)
2.	determining the difference between the ITBW and the real mass (RM) (the positive result confirms a surplus of weight, the negative result – a deficit of weight) difference = RM – ITBW (kg)
3.	determination of energy imbalance: energy imbalance = each extra kg of weight × 6800 (kcal) energy imbalance = each kg in weight deficit × 4100 (kcal)
 4.	determining the caloric value (Q) of the daily ration for maintaining the ITBW:Q (men) = 815+36.6 × ITBW (kcal) Q (women) = 530+31.1 × ITBW (kcal)
5. 	determination of the share of the daily caloric value of correction (necessary to increase or decrease the caloric value of the daily food ration ): share of caloric value = $20\%$ (25%) of Q (kcal)
 6. 	determining the caloric value of the daily food ration for the ITBW correction period: calorific value = $Q \pm share$ of the caloric value (kcal)

7. calculation of the body mass correction duration: correction duration=energy imbalance to be divided by the share of the caloricvalue (in the result is the number of days required for the duration of the correction)
Conclusion  As a result of the calculations, we conclude: the food calorie provides (does notensure) the appropriate energy balance, the surplus (deficit) is equivalent to
kcal, respectively surplus (deficit) in weight of kg.  To maintain the ideal-theoretical mass, the caloric value of the daily food rationmust be kcal. This amount of energy will be consumed daily after the body mass correction period has expired.  To correct the body mass, the daily caloric intake must be reduced (increased). Since the caloric deviation during a day can be admitted within the limits of 20 (25%), the daily caloric intake to reach the ITBW must be reduced (increased) by kcal daily. Thus, the caloric value of the daily food ration over a period of days (ITBW correction period ) will constitute kcal.
Calculate and assess the ideal-theoretical mass according to other methods
Lecturer's signature _

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## THEME: Assessing the correctness of individual nutrition through the calculation method

#### The purpose of the work:

- $\checkmark$  appreciation of the nutrition from energetic point of view;
- ✓ formulating recommendations regarding the correction nutrition in accordance with its physiological norms;
- ✓ learning the methods of assessing the correctness of individual nutrition.

### Report on the work performed

## I. Determining the value of daily energy expenditure

### A. Directed expenses

- 1. All activities within 24 hours are recorded and timed.
- 2. Energy costs are calculated.
  - 2.1. For each type of activity, the energy expenditure values are found, kcal/kg/min (table 5, page 65, General Hygiene, I.Bahnarel, Gh.Ostrofeţ, Lili Groza, vol.I, Chisinau, 2013 *or* table 7, page 15, Igiena, Gh. Ostrofeţ, Lili Groza, L. Cuznetov, Chisinau, 1994).
  - 2.2. Calculate the energy expenditure for the entire duration of the given activity (kcal/kg), by multiplying the duration (min) by the energy expenditure (kcal/kg/min).
  - 2.3. The sum of the products between the duration of the activity (min) and theenergy expenditure (kcal/kg) is made.

Calculation of energy expenditure

		on or energy exp		
			Energy ex	xpenditure
No.	A	Duration		energy expenditure for
	Activity	(min)	kcal/kg/min	the whole
				duration,
				kcal/kg
		of	b	a×b
		_		

		 1
	$\Sigma = 24 \text{ hours}$ (1440 min .)	$\Sigma =$

<b>Directed</b> expenditure (energy expenditure for all activities) = $\Sigma$ energy expenditure for the entire duration (kcal/kg) × body mass (MC)
B. Undirected expenses  a) Energy expenditure to maintain basal metabolism  Basal metabolic rate (BMR) = 1 kcal × MC × 24 hours (kcal/kg/hour)
<ul> <li>b) Energy expenditure for the specific dynamic action of food (thermal effect of food):</li> <li>✓ 20-40% for the protein food ration;</li> <li>✓ 4-8% for the lipid food ration;</li> <li>✓ 2-5% for carbohydrate food ration;</li> <li>✓ ≈ 10% for the mixed food ration.</li> <li>The right option is selected and the share of the basal metabolism value is calculated.</li> </ul>
Daily energy expenditure (directed + undirected) (kcal) shows the sum of energy expenditure for the whole duration (kcal/kg), the value of the basal metabolism(kcal/kg/hour) and the specific dynamic action of food (thermic effect of food)(Calories)

		1		
•	Λn		lusi	An
	.,			.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

Directed energy expenditure is ....... kcal. For the basal metabolism is ...... kcal, and the specific dynamic action of food (thermal effect of food) requires ...... kcal.

The total energy requirement for 24 hours is ......... kcal. So, according to therecommended energy values, I am referring to the population group (According to the table, I should have been part of population group I. The deviation may be caused by an incomplete, less accurate timing).

#### II. The caloric value of the food ration

Determination of the caloric value of the food ration

				alue, kcal
The name of the pieces	Food products used	Quantity, g	for 100g. product	for the whole quantity
1	2	3	4	5
Breakfast				
Total breakfast				
Lunch				
Total lunch				
<b>Dinner</b>				
Dinner			1	<u> </u>
Total dinner				
Total / day				

Determination of the daily caloric value after meals (in % of the general amount)

Table	The results according to the calculations	The caloric value of the food ration according to the norms
1	2	3
luncheon		
The lunch		
Dinner		

#### **Conclusion**

According to the calculations made, the caloric value of the daily ration is ......kcal, which (does not) correspond to the previously calculated physiological needs (it differs by ......kcal). Taking into account the fact that students refer to population group I according to the recommended energy values, the energy requirement in 24 hours must be kcal. The caloric value of the ration (doesn't) satisfy these needs (probably due to incomplete calculations).

The caloric value of the daily ration on account of breakfast is ......%, on account of lunch ......%, on account of dinner %, which (not) corresponds to the norms ( ).

#### **General conclusion**

From the calculations we deduce that the surplus (deficit) in weight is caused by the reduced (exaggerated) physical activities, and (or) the increased (reduced) caloric value of the food ration.

#### Recommendation

- 1. To increase (decrease) the caloric value of the food ration by ...... kcal.
- 2. To correct the diet, increasing (decrease) the caloric value of breakfast by %, lunch by ......%, dinner by .... %.

Lecturer's signature \_

date month year

#### Practical work №

#### THEME: Elaboration of the distribution menu

#### The purpose of the work:

- ✓ learning the methodology for drawing up the distribution menu;
- ✓ learning the methods of determining the chemical composition and the caloric value of the food ration and evaluating the results;
- ✓ appreciation of the prepared menu.

#### Report on the work performed

distribution menu for the food of population groups (e.g. children, adults, etc.), using daily consumption norms (tab. 11, 12, pages 76-78, General hygiene: Practical works. I.Bahnarel, Gh. Ostrofeţ, Lili Groza, vol. I, Chisinau, 2013).

Menu

## Caloric value and the chemical composition of the food ration

			prot	eins	lipids				:-	1		V	itamiı	ns		
			r		F			Š	Sa	neral ılts						
		, 89					S	ber								
Type of food	Products included	tity	nal	etal	nal	etal	carbs	ılfi				oter	В	В		energy value, kcal
	in the dish	quantity, g	animal	vegetal	animal	vegetal	9	vegetalfi bers	Ca	P	A	Caroten	1	2	С	
		d		ŕ		ŕ		ve	Cu	1						
Breakfast									1		1	I				
Total breakfast																
Lunch			,		1			r		1	,	1		1	1	
							-									

	1			1					1		1	
Total lunch												
Dinner		•		·		•		•	•	•	•	
Total dinner												
Total / day			_		_				_			

Conclusion	

Evaluation of the food ration (to be completed)

No.	Indices	Individual data	nomac
		marviduai data	norms
1	Daily calories, kcal		
2	Protein (gr.)		
	including - animal		
3	Lipids (gr.)		
	including - animal		
4	Carbohydrates (gr.)		
5	% of calories on the account:		
	protein		
	lipids		
	carbs		
6	P:L:C ratio		
7	Distribution of calories at meals, %		
	breakfast		
	lunch		
	dinner		
8	Vitamin A, mg		
9	Vitamin C, mg		
10	Ca, mg		
11	P, mg		
12	Ca: P		
NT 4	· 20 400/ C · C · 1 . 1		00/ 6.41

Note: since 30-40% of vitamin C is destroyed during heat processing, 60% of the calculated amount will be taken.

#### **Conclusion**

From the o	btained	results	we	deduce	that	food	ensures	(does	not	ensure	:)
energyexpenditure	e. The su	ırplus (d	lefic	cit) is	kca	1.					

The amount of proteins is ......g, lipids ...... g, carbohydrates ......

which corresponds (does not correspond) to hygienic standards.

The amount of vitamin C is ......mg%, being sufficient (insufficient). The amount of vitamin A, Ca salts, P corresponds (does not correspond) to hygienic standards.

The diet corresponds (does not correspond) to the requirements.

#### Recommendation

nount of	•		·	asing (decrease)	)

To '
It is necessary to increase (decrease): the amount of protein withg, on account of the following food products
the amount of protein withg, on account of the following food products
the amount of lipids withg, on account of the following food products
the amount of carbohydrates withg, on account of the following food products
The necessary amount of vitamin A can be recovered on account of the products
of vitamin C
of Ca salts
of the salts of P
The correction of the diet can be achieved by increasing (reducing) the caloric value of breakfast, lunch, dinner by%,%, respectively.

Lecturer's signature \_

date month year		

# THEME: Research of vitamin content in food products. Appreciation of the vitamin value of the food ration. Control over the body supply with vitamin C

#### The purpose of the work:

- ✓ learning the methods for determining vitamin C in food products;
- ✓ learning the methods of determining the body's saturation with vitamin C.

#### Report on the work performed

## I. Determination of ascorbic acid in vegetables and conifer decoction:

- 1. Method used: titrometric method with Tilmans reagent.
- 2. The principle of the method is based on the redox reaction between ascorbic acidand Tilmans reagent. Ascorbic acid, being oxidized, reduces the Tilmans reagent. The Tilmans reagent in the neutral and alkaline medium has a blue color, in the acidic medium red. Thus, the reagent, being reduced by ascorbic acid, discolors (the blue color changes to pale pink).

The amount of vitamin C in vegetables and decoction of conifers

				Boiled	potato	
indicator	Onion	Cabba ge	Potato	The amount	% loss	Decoction of conifers
1	2	3	4	5	6	7
Tilmans reagent consumed during the titration, ml					-	
The amount of extractive solution (HCl 2%), ml						
The amount of food product sampled, g						
The volume of extract taken for titration, ml						
The quantity of vit. C, mg%						
Normative value, mg%						

#### Conclusion

**Variant 1**. The amount of vitamin C in all raw vegetables corresponds to the normativevalues due to the fact that they are freshly collected and the vitamins did not manage to destroy during storage. In cooked vegetables, the amount of vitamin C is lower than in raw vegetables, which proves its destruction during thermal processing. The amount of vitamin C in the decoction of conifers corresponds to the normative values, which proves that it was correctly and recently prepared.

										vegetables
does not duringsto vegetable percentag vitamin (	corrorage es, proge of the control of the correct control of the correct control of the correct correc	espon . In co pof of destru he dec	d to the nooked vegotis destruction of vection of contraction of c	ormanetable etable ction of the	tive values s, the amo during the to C is with	s, prount outhermain the than the	bably f vita all proesure the second terms of	as a remin C is occessing wed limbole	esult of s lower g of vego its. The alues, w	destruction than in raw etables. The e amount of which proves
<ul> <li>Direct</li> <li>determ</li> <li>determ</li> <li>Indirect</li> <li>determ</li> <li>determ</li> <li>durat</li> <li>the number of the determ</li> <li>saturat</li> <li>tongument</li> <li>the direct</li> <li>the direct</li> <li>the direct</li> <li>the use</li> </ul>	et me minat minat ect n minat ion o umbe egree ation e test is cold to e of the cold to e o	thods ion of ion of nethod ion of f hold of cap of the t (with	vitamin Contains the such that	C in the cin under cresistance istance havitante check the drawer control cont	ine.  ance  cup – 3 mi ed  e  min C	n  tongu		sec		
Conc	lusio	n								
					T					
					Lec	turer'	s sign	nature _		

date month year	

## THEME: Hygienic assessment of the quality of some food products (sanitary expertise of some of the main food products)

## The purpose of the work:

- ✓ knowing the quality indices of milk, meat, fish and bread according to the TechnicalRegulations;
- ✓ assessing the quality of milk and dairy products.

### Report on the work performed

the quality indices of milk and dairy products according to the TechnicalRegulation "Milk and dairy products" (2010)

			Milk		•	Ket		So cre	
Indices	Sample N o.1	Sample N o.2	Sample N o.3	Sample N o.4	Norm	Sample	Norm	Sample	Norm
Organoleptic indices									
color									
smell									
taste									
Physico -chemical indice	?S								
density, g/ cm2					1,024- 1,030	X		X	
acidity, °T					16- 20		25-130		60-100
Try at:									
starch						7	K	2	K
Sodium bicarbonate						7	K	7	K
pasteurization						7	K	7	K

#### **Conclusion**

Variant 1.	The evidence of			• • • • • • • • • • • • • • • • • • • •	
fully corres	pond to the hygien	e requirements	in force and can be u	ised in nu	trition.
Option 2. T	The evidence of			•••••	
•	-	• •	requirements		
`			) and can be use		
certain restr	rictions (thermal pr	rocessing			).

	rements in force (because
and can only be administered in animal	feed.
	ements in force (because
	) and adatory
Determination of bread quality indices ac	cording to the Technical Regulation"Bakery
	oducts" (2007).
Indices Characte	
The name of the bread	1,0111
Organole	eptic indices
Exterior aspect:	
• surface	
• color	
Form	
Characteristic of the shell	
Core feature:	
• smell	
• taste	
Physico -ch	emical indices
Humidity, %	30-50
Porosity, %	51-65
Acidity, <sup>a</sup> T	1.5-8.0
Conclusion	
	Lecturer's signature

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## Practical work $N_2$ THEME: Food poisoning, their prevention. Research methods

## The purpose of the work:

- ✓ acquiring the research technique of food poisoning cases;
- ✓ formulating preventive measures.

Solving the situation problem
Problem No
1. What microorganisms, toxins, substances, plants, etc. could they have caused theintoxication?
2. What food products or what dishes were the cause of food poisoning?
3. What conditions contributed to the emergence of food poisoning?
4. What emergency measures must be taken and who exactly must execute them?

	What questions will be asked to those affected (or relatives) to elucidate the case?
• • • •	
•••	
• • • •	
• • •	
6.	What materials will be sent to the laboratory and by whom?
• • • •	
• • •	
• • •	
• • • •	
• • •	
• • • •	
• • • •	
• • • •	
	ediagnosis?
• • • •	
8.	What preventive measures will you take?
8.	What preventive measures will you take?
8.	What preventive measures will you take?
8.	What preventive measures will you take?
8.	What preventive measures will you take?
8.	What preventive measures will you take?
8.	What preventive measures will you take?
	What preventive measures will you take?  Onclusion (form of intoxication according to classification)

Lecturer's signature \_

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## THEME: Hygienic assessment of drinking water quality

### The purpose of the work:

- ✓ learning the methods of preventing diseases caused by the use of low-quality water;
- ✓ learning the methods of determining the physical and chemical properties of water;
- ✓ appreciation of the results obtained.

## Report on the work performed

Determination of drinking water quality indices

Indices Water samples							Norm	
		1	2	3	4	5	6	
	Organoleptic indices							
Smell, °								
Taste, °								
Color, o								
Transparency	, cm							
Physico -chemical indices								
pH								
Ammonia, m								
Nitrites, mg/l								
Nitrates, mg/l								
Chlorides, mg								
Sulfates, mg/								
Iron, mg/l								
Oxidability, r	ng/l of O <sub>2</sub>							
General	mg							
hardness	equivalent /l							
	°G*							

<sup>\*</sup>  $^{\rm o}$  G= mg equiv/l × 2.8

Cor	elucion										
hard	lness which are	mad	e in ret	ort	S.						
All	determinations	are	made	in	test	tubes,	except	for	oxidability	and	general
NB	All determination	ons a	re qual	ıtat	ive. I	Nitrates	are dete	rmıı	ned using dip	heny	lamıne.

Conclusion	

Problem No
Lecturer's signature _

 data month your	

## THEME: Water quality conditioning methods The purpose of the work:

- ✓ systematizing knowledge about water conditioning methods;
- ✓ learning water conditioning methods.

## Report on the work performed

I. Coagulation of water

Tediose	Water samples					
Indices	1	2	3			
Temporary water hardness,						
mg.equiv/l						
Dose of coagulant mg/l						
(for 200 ml of water) according to						
the table						
Coagulant dosage determined						
experimentally, mg/l						
Final dose of coagulant (for 1						
liter of water)						
The amount of dry coagulant for						
1 liter of water, g						

### II. Water chlorination

		Water samples							
Indices		1		2		3			
		cup		cup			cup		
		2	3	1	2	3	1	2	3
Amount of lime chloride 1%, added, ml	0.1	0.2	0.3	0.1	0.2	0.3	0.1	0.2	0.3
Amount of sodium thiosulphate $0.001N$ (at titration), ml $(x)$									
Residual chlorine, mg/l									
The chosen glass									
Chlorine dose for 1 liter of water, mg/l									
The amount of dry lime chloride per 1 liter of water									

Residual chlorine =  $x \times 0.0355 \times 5$ 

Conclusion
Recommendations for improving the quality of drinking water after the
results obtained from the analysis of water samples in the previous work
results obtained if one the unarysis of water samples in the previous work
Lecturer's signature _

date month year

#### Practical work №

THEME: Chemical factors of the air environment and their influence on the body. Air pollution with bacteria and dust. Express methods for the determination of chemical substances in air. Determination of CO<sub>2</sub> according to the Vinocuroff method

### The purpose of the work:

- ✓ knowledge of air collection methods for the determination of chemical substances and dust;
- ✓ learning the methods of determining some chemical substances and dust in the air;
- ✓ proposing and arguing recommendations for improving air quality.

I. Determination of CO <sub>2</sub> content in rooms (Vinocuroff method)	
• volume of collected air	ml
• conditioning volume (V <sub>o</sub> )	
• concentration of CO <sub>2</sub> mg.	
• the standard value of CO <sub>2</sub> in different roomsmg/	
II. Determination of SO <sub>2</sub> content in rooms	/III (/0)
_	1
• volume of collected air	
• conditioning volume (V <sub>o</sub> )	_
• concentration of SO <sub>2</sub>	$mg/m^3$
• the standard value of SO <sub>2</sub> in the rooms	$mg/m^3$
III. Determination of the content of toxic substances with the UG-2 gas a ammonia.	
standard value of ammonia in rooms	
	$\mathcal{C}$
Conclusion	

	• • •
	• • •
	• • •
	•••
	• • •
Recommendations to improve air quality	
	• • •
	• • •
	• • •
	• • •
	•••
	• • •
	• • •
	• • •
	• • •
	• • •
III. Solving the homework problem	
Problem No	
Lecturer's signature _	

date month year

### Practical work №

## THEME: Hygienic assessment of the microclimate in children and medical institutions (Part I)

## The purpose of the work:

- ✓ learning the methods of studying and assessing the microclimate factors in the rooms;
- ✓ knowledge of the sanitary norms of the microclimate.

Report on the work performed  1. Determination of the temperature regime in the rooms  1.1. Note the air temperature norms for different rooms.	
1.2. Note the allowed temperature differences horizontally and vertically.	
1.3. Note the air temperature measurement points for establishing temperatureregime in the room.	the
1.4. Note the air temperature measuring devices.	

#### 1.5. The results.

#### Air temperature in the room

Hoight from	Temperature on the diagonal, ° C Horiz					
Height from the floor, m	to the inner wall	in the middle of the room	temperature difference			
0.1						
1.0						
1.5						
Vertical						
temperature						
difference						

#### Conclusion

**Variant 1**. The temperature regime in the room indicates a uniform temperature, because the horizontal and vertical temperature difference does not exceed the normative values. An average temperature value of ...... is recorded.  $^{\circ}C_{-}$ 

**Option 2**. The temperature regime in the room indicates an uneven temperature, because the horizontal and /or vertical temperature difference (underline) exceeds the normative values, constituting ..... ° C.

An average temperature value of... is recorded. °C\_

2. Determination of air humidity
2.1. List the types of air humidity.
2.2. Note the air humidity standards for different rooms.
2.2. Note the air number standards for different rooms.
2.2. List the devices for massuring air hymidity
2.3. List the devices for measuring air humidity.

2.4. The results:	
<ul> <li>dry thermometer indications</li> </ul>	
- the August psychrometer	
- Assman psychrometer	
• the indications of the wet thermometer	
- the August psychrometer	
- Assman psychrometer	
2.4.1. Calculate the absolute humidity of the	
•	e an.
- with the August psychrometer	
- with the Assman psychrometer	
with the Assiran psychronicter	
2.4.2. Determine the relative humidity of the	ne air:
•	ne air:
a) according to calculations:	ne air:
•	ne air:
a) according to calculations:	ne air:
a) according to calculations:	
<ul><li>a) according to calculations:</li><li>with the August psychrometer</li></ul>	
<ul><li>a) according to calculations:</li><li>with the August psychrometer</li></ul>	
<ul><li>a) according to calculations:</li><li>with the August psychrometer</li></ul>	
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a) according to calculations: - with the August psychrometer	
a) according to calculations: - with the August psychrometer	
a) according to calculations: - with the August psychrometer	
a) according to calculations: - with the August psychrometer	

b) according to the table: - with the August psychrometer
- with the Assman psychrometer
~ 1 ·
Conclusion
3. of air movement speed (air velocity)
3.1. Name the air movement speed norms for different rooms.

Catathermometry:	
• the type of catathermometer used	
• the catathermometer factor (F)	
• the time of descent of the alcohol column	• • •
<ul><li>air cooling capacity</li></ul>	
• air mayamant anaad	
• air movement speed	
3.3. Air movement speed outside the room:	
a) with vane anemometer	
······································	
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
b) with cup anemometer	
Conclusion	
Conclusion	

Solving the homework problem
Problem No

Lecturer's signature \_

date month year

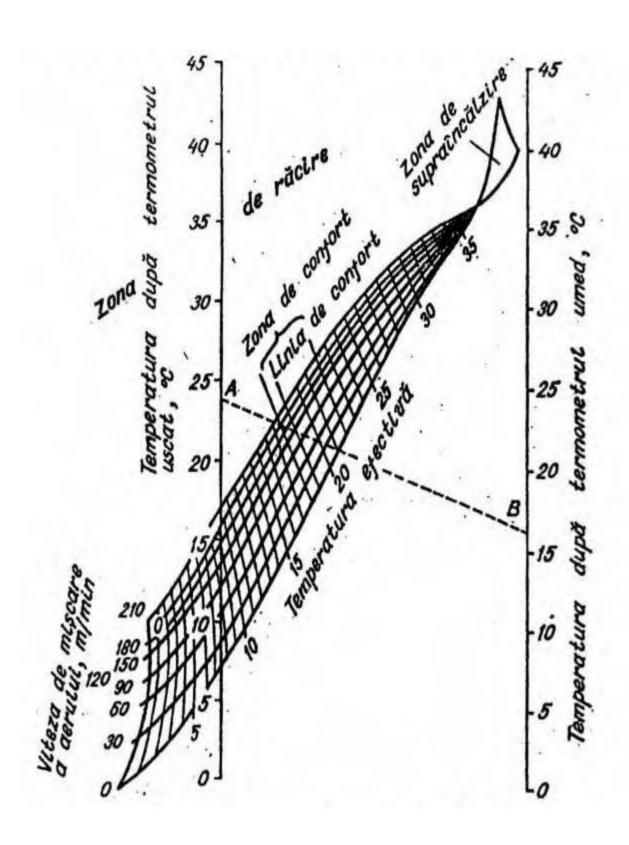
### Practical work №

## THEME: Hygienic assessment of the microclimate in children and medical institutions (Part II)

## The purpose of the work:

- ✓ learning the methods of studying and appreciating the complex action of microclimate factors;
- $\checkmark$  knowledge of the sanitary norms of the microclimate.

1. Determination of the effective temperature  1.1 . Write down the definition of effective temperature.		
1.2. Note the actual temperature norms.		
1.2 D 1		
1.3. Results:		
1.3.1. actual temperature based on the tables		
1		
1.3.2. effective temperature based on the nomogram		
1.3.2. effective temperature based on the nomogram		
• its value and appreciation		



Effective temperature nomogram

Conclusion	
2. Determination of atmospheric pressure	
2.1. List the devices for measuring atmospheric pressur	e
2.1. Elist the devices for measuring atmospheric pressur	····
2.2. Record the results of the determination.	
2 Determining the wind rese (problem solving)	
<b>3. Determining the wind rose</b> (problem solving)	
	•••••
	•••••
Lecturer's sig	gnature

date	month	year
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## THEME: Hygienic assessment of natural lighting in children and medical institutions

## The purpose of the work:

- ✓ learning the methods of determining natural lighting indices;
- ✓ assessing the lighting and formulating recommendations to improve the assessed indices.

<ul> <li>I. Determination of natural lighting</li> <li>position, configuration and window sizes</li> </ul>
• window orientation
• distance between two windows, cm
• E <sub>i</sub> (the lighting inside the room)
• It <sub>is</sub> (lighting outside the room)
• surface of the windows
• floor surface
• distance from the floor to the windowsill, cm
• the distance from the floor to the upper edge of the window, cm
• distance from the upper edge of the window to the roof, cm
• distance from the center of the work table to the window (leg BC)
• room depth, cm
• the device used to determine NCI

Indications of natural lighting

Indices	The data obtained	Norm	Findings
NCL, %			
The brightness coefficient			
The angle of incidence, °			
The opening angle, °			
Depth coefficient			
The degree of light absorption			
by the windows, %			

Conclusion
Recommendations to improve the lighting in the researched room
recommendations to improve the figuring in the researched room

II. Solving the homework problem
Problem No
Lecturer's signature _

#### **Practical work №**

### THEME: Hygienic assessment of artificial lighting in children and medical institutions

### The purpose of the work:

- ✓ learning the methods of determining artificial lighting indices;
- ✓ assessing the lighting and formulating recommendations to improve the assessed indices.

Report on the work performed
I. Appreciation of artificial lighting
1.1. light intensity at the workplace, lx
1.2. calculation according to the «e» coefficient
• the number of incandescent lamps
• the power of incandescent lamps, W
• total power, W
• the surface of the room, m <sup>2</sup>
• the specific power of the lamps, W/m <sup>2</sup>
• coefficient «e»
• lighting, lx
1.3. calculation according to the "Watt" method
• the number of incandescent lamps
• the power of incandescent lamps, W
• the specific power of the lamps, W/m <sup>2</sup>
• lighting at the specified specific power of 10 W/m <sup>2</sup> , lx
nghang at the specific power of 10 win, in
• lighting, lx
1.4. calculation of the specific power of incandescent lamps for standard lighting
1.5. calculation of the number of incandescent lamps for standard lighting
1.6. determining the level of illumination according to the specific power of the
lampsfluorescent
• the number of fluorescent lamps
• power of fluorescent lamps, W
• total power, W
• the surface of the room, m <sup>2</sup>
• the specific power of the lamps, W/m <sup>2</sup>
• lighting, lx
1.7. calculation of the specific power of luminescent lamps for standard lighting
1.8. calculation of the number of fluorescent lamps for standard lighting
1.9. determining the reflection coefficient of the fund
• the intensity of the light falling on the surface, lx
• intensity of light reflected from the surface, lx
1.10. calculation of the brightness index of the illuminated surface
• illumination (luxmetry), lx

• surface reflection coefficient ( surface	ce color	•••••	)
1.11. determining the uniformity of ligh	nting		
• illumination in the first point, lx	C		
	stance of 0.75 m f	nom the final	+ maint)
• lighting at the second point (at a dis	stance of 0.73 m n	fom the mist	t pomt),
lx	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •	
Indicatio	ns of artificial ligh	iting	
In diana	The data	Nome	Eindin oo
Indices	obtained	Norm	Findings
The reflection coefficient of the fund			
Brightness of the illuminated surface,			
cd/m <sup>2</sup>			
Uniformity of lighting			
Conclusion			
		• • • • • • • • • • • • • • • • • • • •	
		•••••	• • • • • • • • • • • • • • • • • • • •
Recommendations to improve the lig	hting in the resea	rched room	1
TT C-1-2 411			
II. Solving the homework problem			
Problem No			
		• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •
		•••••	
	Lecturer's signa	iture _	

### **Practical work №**

### THEME: Hygienic assessment of room ventilation and heating

The purpose	•				
_	n of calculation		cory methods	for assessing	
	essventilation	_		1 .1 1 .	1
√ assessmen	nt and recomm	endation of n	neasures based	on the data of	obtained.
	1	Report on the	e work perfoi	·med	
1. CO 2 conte		_	_		%
	evaluation of		-	,	
• •					
• •	of people in th				
2.3. room vo	lumem <sup>3</sup>				
_	volume of air		_		_
	one person				
	persons			•••••	m <sup>3</sup> /h
	ssary multiple		•		
	one person				
	persons				
	multiple of the		_		$\dots \dots m^3/h$
2.7. tile fear i	numple of the	an exchange	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •	
	Assessm	ent of effectiv	eness ventilat	ion	
indices	Necessary	Real	Norm	Findings	
entilation			$L_n \leqslant L_r$		
olume	$L_n =$	$L_r =$	$\mathbf{L}_{\mathrm{n}} \sim \mathrm{Lr}$		calculation
					method
Iultiple air	$S_n =$	$S_r =$	$S_n \leq S_r$		
xchange	D <sub>n</sub> –	S <sub>r</sub> –			
O2	0.07-0.1%	x=	01 <b>≥x</b>		laboratory
O2 _	0.07-0.170	Λ-			method
Conclusion					

3. Hygienic assessment of heating
3.1. heating system
3.2. type of heating devices
3.3. their location
3.4. room volumem <sup>3</sup>
3.5. the real surface of the radiator sections
3.6. the actual number of sections
3.7. the required area of the radiator sections
3.8. the required number of sections
3.9. horizontal temperature difference
3.10. vertical temperature difference° C
Conclusion
Recommendations to improve the air environment
IV. Solving the homework problem
Problem No
Lecturer's signature _

 date month year	

#### **Practical work №**

THEME: Expertise of hospital projects. Appreciation of the location, systematization of the units and specialized departments of hospitals

### The purpose of the work:

- ✓ acquiring the methods of general expertise of hospital construction projects;
- ✓ hygienic assessment of the location and internal systematization of hospitals.

# Report on the work performed SCHEME-INSTRUCTION FOR EXPERTISE OF THE HOSPITAL PROJECT

PROJECT

Based on the materials and drawings, make the hygienic

characteristic of theproject.	
1. take knowledge of the project explanation, note:	
- the name of the hospital project	
- which blocks the hospital complex includes	
which blocks the hospital complex hierades	
2 take knowledge of the cituational plan:	
2. take knowledge of the situational plan:	
- appreciate the correctness of the choice of the place (land) for the construction	
•	
- appreciate the correctness of the choice of the place (land) for the construction of the hospital (variety of wind frequency, natural factors, possible sources of air	
- appreciate the correctness of the choice of the place (land) for the construction	
- appreciate the correctness of the choice of the place (land) for the construction of the hospital (variety of wind frequency, natural factors, possible sources of air pollution - dust, toxic chemicals, noise, etc.)	
- appreciate the correctness of the choice of the place (land) for the construction of the hospital (variety of wind frequency, natural factors, possible sources of air pollution - dust, toxic chemicals, noise, etc.)	
- appreciate the correctness of the choice of the place (land) for the construction of the hospital (variety of wind frequency, natural factors, possible sources of air pollution - dust, toxic chemicals, noise, etc.)	
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- appreciate the correctness of the choice of the place (land) for the construction of the hospital (variety of wind frequency, natural factors, possible sources of air pollution - dust, toxic chemicals, noise, etc.)	
- appreciate the correctness of the choice of the place (land) for the construction of the hospital (variety of wind frequency, natural factors, possible sources of air pollution - dust, toxic chemicals, noise, etc.)	

3. Appreciate the general plan of the hospital:
- construction system
- functional areas and their location
- the number of field accesses
- the humber of field accesses
- the configuration
- the surface of the land
- surface to a bed
- land construction density
- characteristic of the green area: the total area and the area per bed (for the
contagious diseases section it will be characterized separately)
4 1 1 1
- the distance between the blocks

the distance between the blocks and the borders of the land
road characterization
characterization of accesses
characterization of walking paths
sketch the general plan of the hospital

4. take knowledge of the explanatory note and the drawings of the main block the departments in the main block, how many beds each department h connection between the departments and other hospital services, appreciate t	as, the them.
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	• • • • • • • •
<ul><li>5. Review and appreciated admission department. General Admission Sectio</li><li>ensuring the principle of flow when admitting patients</li></ul>	
- ensuring the principle of flow when admitting patients	
- ensuring the principle of flow when admitting patients	
- ensuring the principle of flow when admitting patients	
- ensuring the principle of flow when admitting patients	
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- ensuring the principle of flow when admitting patients	
- ensuring the principle of flow when admitting patients	
- ensuring the principle of flow when admitting patients	
- ensuring the principle of flow when admitting patients	
- ensuring the principle of flow when admitting patients  - the characteristics of the rooms and their surfaces	
- ensuring the principle of flow when admitting patients  - the characteristics of the rooms and their surfaces	
- ensuring the principle of flow when admitting patients  - the characteristics of the rooms and their surfaces	
- ensuring the principle of flow when admitting patients  - the characteristics of the rooms and their surfaces	

- organization of hospitalization in the department of contagious diseases:number andthe surfaces of the rooms

- organization of hospitalization of women in labor: location of the section and itsspecificity
- rooms for discharge of patients, their location
6. Rate the medical care unit (therapy):
- the number of medical care units
- characterization of the corridor (type, width)
- the number of rooms in the department, how many beds each is provided for
- what rooms each health care facility includes
- common rooms for the entire therapy department
- location of the nursing position

- the distance from the nurse's station to the farthest ward	
- room for manipulations: orientation, surface	
- day rest room for the sick: its location, surface	
- the sanitary block for the sick, where it is located, how many rooms it has	
7. Hygienic characteristics of two wards: - total area and a bed in the lounge for 2 beds	
7. Hygienic characteristics of two wards:  - total area and a bed in the lounge for 2 beds  - total area and a bed in the lounge for 4 beds	
7. Hygienic characteristics of two wards:  - total area and a bed in the lounge for 2 beds  - total area and a bed in the lounge for 4 beds  - arranging the beds in front of the windows  - window orientation	
7. Hygienic characteristics of two wards:  - total area and a bed in the lounge for 2 beds  - total area and a bed in the lounge for 4 beds  - arranging the beds in front of the windows	

- the deepening coefficient
- the characteristic of the artificial lighting of the wards
•••••••••••••••••••••••••••••••••••••••
- the distance between the beds
- the distance from the outer wall to the beds
9. Sanitary apporting of the gurgory denortment and the diagnostic blocks
8. Sanitary expertise of the surgery department and the diagnostic block:
- the connection between the operating block of the surgery department and thediagnostic block
- the dressing room, the surface, the orientation
- location of the purulent surgery department
•••••••••••••••••••••••••••••••
- the location and number of postoperative rooms, how many beds are in each
9. Appreciate the specifics of the operating unit:
location of the operating room in the hospital system
- the connection of the operating room with the surgery department, the hospitalization department and the radiology office

- the rooms of the operating room
- operating rooms there are, their correspondence with the number of beds in the ward
- whether or not there is an operating room for septic patients
- operating room: orientation, surface, characteristic of natural lighting(NCL, LC)
- preoperative room (surface)
- the room for the anesthesia machine: its location in relation to the operating roomand the one PREOPERATIVE
- the sterilization room: its location, the connection with the operating room
- ther rooms of the operating room
10. A
<ul><li>10. Appreciate section of contagious diseases:</li><li>location of the department in the hospital complex</li></ul>

- what rooms does the department have?
- 1
- admission booths, corresponding number of booths to the number of bedsfrom
the section, their surface
- types of wards
- the percentage of beds in half-box, box (isolation room), wards compared to the totalnumber
- the internal systematization of the box, half-box, surface, orientation, number of box beds (half-box)
andinanty halla
ordinary halls
- organizing the feeding of the sick, sterilizing dishes
11 Appreciate the enecificity of maternity systematization:

- 11. Appreciate the specificity of maternity systematization:isolation of the maternity ward from the gynecological department

- the presence of prenatal and postnatal rooms for physiology and observation units; compound and the area of the rooms for the admission of women in labor
- rooms: orientation, number of seats, surface area per bed
- birth block
- characterization of lounges for infants and newborns: number of seats orientation, surface area per bed, hatch
- location of the observation section compared to the physiological one, the composition of the rooms
- the presence of boxed ward for newborns
- the presence of boxes for the isolation of babies and newborns
12. Appreciation of the internal systematization of the gynecology department: - is it a small operating room or not, the preoperative room: the orientation, thesurface

- manipulation room: orientation, surface
- connection with the physiotherapy service
13. The sanitary expertise and assessment of the pediatric department:
- location of the section compared to the sections for adults
- the number of beds in the department
- pediatric department communicate with others or not
- it is possible to quarantine the section
- It is possible to quarantine the section
- whether or not there are boxed rooms or boxes for the isolation of children in the department
1 1
- total area and for a bed
- the percentage of beds in north-facing rooms
- game room: orientation, surface

	or children's daytime sl		
- the room for treat	tment with ultraviolet 1	rays, its surface	
- the rooms for mo	thers, where they are le	ocated, for how man	ny places
- rooms for breastf	U		
	n of the auxiliary block		
connection	the particularities of with	f systematization a the	and exploitation, the curative
blocks			
			•••••
	• • • • • • • • • • • • • • • • • • • •		
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			•••••
			••••
Conclusion			

Recommendation

#### Practical work №

### THEME: The sanitary -hygienic regime in hospitals. Prevention of nosocomial(in-hospital) infections

### The purpose of the work:

- ✓ getting knowledge and the necessary skills in organizing and ensuring the sanitary-hygienic regime in hospitals;
- ✓ taking measures to prevent nosocomial infections.

# Report on the work performedSolving the homework problem Problem No. ...... ......

***************************************

### **Practical work №**

### THEME: Physical and intellectual work. Functional changes in the body duringthe work process

### The purpose of the work:

- $\checkmark$  assimilation of the changes occurring in the body during work;
- ✓ learning the physiological methods of investigations during work;
- $\checkmark$  acquiring the methodology for assessing the degree of physical effort or body strain;
- ✓ recommending measures to prevent fatigue and maintaining work capacity.

### Report on the work performed

Investigation of physiological changes

Indices	before activity	after activity	after 10 minute
Central nervous system			
the latent period of the reaction video engines, ms			
the latent period of the reaction acustomotori, ms			
working memory %			
Strength attention, s			
Cardiovascular system			
frequency, beat/min			
blood pressure, mmHg			
systolic blood pressure, mmHg			
diastolic pressure, mmHg			
pulse pressure, mmHg			
mean dynamic pressure, mmHg			
systolic flow, ml			
cardiac output, l/min			
Respiratory system			
frequency breathing / min			
respiratory volume, 1			
The neuromuscular apparatus			
♦ Tremometry			
the number of touches/s			
♦ Dinamometry			
muscle strength, kg			
muscular resistance, s		_	

Conclusion (appreciate functional changes during work and during the recovery
period, indicate signs of fatigue)

Solving the homework problem
Problem No

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#### Practical work No

### THEME: Medical assistance of industrial workers. Notions about diseases andoccupational intoxications. Prevention of occupational diseases

### The purpose of the work:

- ✓ assessment of the influence of production factors on workers' health;
- ✓ scheduling and carrying out measures to improve working conditions to maintain them workers' health;
- ✓ estimating the role of preventive and periodic medical examinations in the prevention of general and professional morbidity and in the prevention of accidents:
- ✓ argumentation of occupational disease prevention measures.

### Report on the work performed

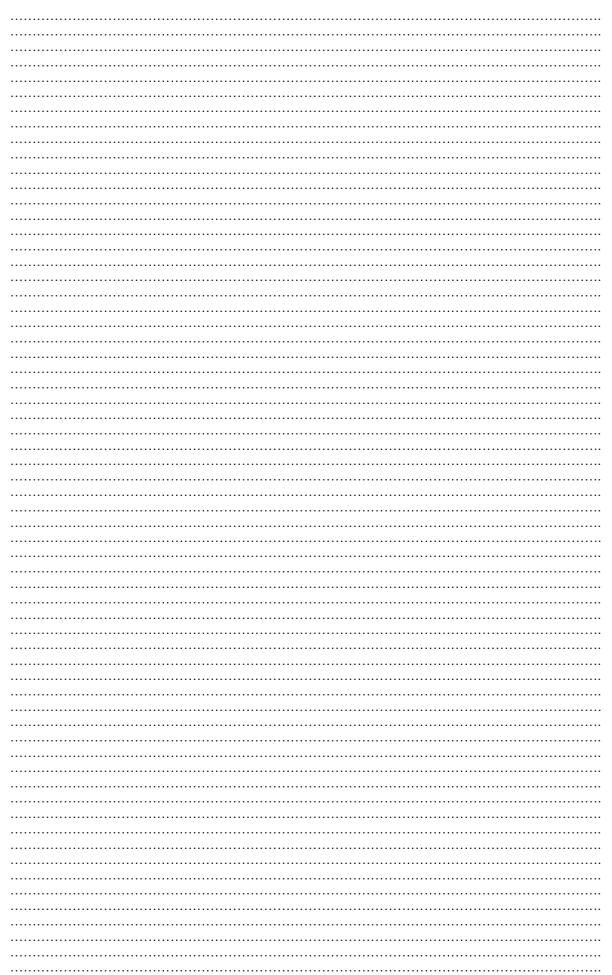
Extract from Appendices I-VI of GD no. 1025 of 07.09.2016 for the

I. Note:

II.

- directions within the industrial enterprises;
- the functions of the doctor in case of occupational poisoning;
- the knowledge necessary for the curative doctor in industrial enterprises;
- organizing and performing preventive and periodic medical checks.

approvalof the Health Regulation regarding the health supervision of persons exposed tothe action of occupational risk factors	7



Solving the homework problem
Problem No

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#### Practical work №

### THEME: Methods of research and assessment of children's physical development and teenagers

### The purpose of the work:

- ✓ learning the methods of assessing the individual and collective physical development of children and teenagers;
- ✓ learning the methods of establishing health groups.

### Report on the work performed

### I. Appreciation of the level of physical development of children and teenagers

1. Complete the table

Child's	Age	Kind	Waist	Body	Chest	The vital
name/surname			(cm)	mass	Circumference	capacity of
				(kg)	at Rest (cm)	the lungs
1						
2						
3						

2. Preparation of variational-statistical tables for each researched somatometric index(waist, cm; body mass, kg; chest perimeter, cm).

To set the variational string, the minimum and maximum values are found in the number of cards proposed. Arrange the sheets in ascending order of the index (waist, cm; body mass, kg; chest perimeter, cm) and include the data in the table in column  $1 - index \ variant \ (a)$ . A separate table is prepared for each index. Count the number of cards with the same variant of the index and enter them in column  $2 - the \ number \ of \ cases \ (p)$ , next to the respective variant (a). As a result, all the cases in the string are distributed variational and it is established frequency (p) the repetition of each case.

Gender\_\_\_\_\_\_, age\_\_\_\_\_\_of the group of examined children.

waisi, cm	$\iota$					
№	Indices, a	Frequency, p	$a \times p$	(M-a)=d	$d^{2}$	$d^2 \times p$
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

11		I	ī		I	I	
13       14         15       16         17       18         19       20         21       22         23       24         25       26         27       28         29       30         31       32         33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         51       52	11						
14       15         16       17         18       19         20       21         21       22         23       24         25       26         27       28         29       30         30       31         32       33         34       35         36       37         38       39         40       41         42       43         43       44         45       46         47       48         49       50         51       50         51       52							
15	13						
15	14						
16       17         18       19         20       21         21       22         23       24         25       26         27       28         29       30         30       31         32       33         34       35         36       37         38       39         40       41         42       43         44       45         46       47         48       49         50       51         51       52							
17       18         19       9         20       21         21       22         23       24         25       26         27       28         29       30         31       32         33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         51       52							
18       19         20       21         21       22         23       24         25       26         27       28         29       30         31       32         33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         51       50         51       52							
19       20       21       22       23       24       25       26       27       28       29       30       31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50       51       52							
20       21       22       23       24       25       26       27       28       29       30       31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50       51       52							
21       22       23       24       25       26       27       28       29       30       31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50       51       52							
22       23       24       25       26       27       28       29       30       31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50       51       52							
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24         25         26         27         28         29         30         31         32         33         34         35         36         37         38         39         40         41         42         43         44         45         46         47         48         49         50         51         52							
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52							
26       27         28       29         30       31         32       33         34       35         36       37         38       39         40       41         41       42         43       44         45       46         47       48         49       50         51       52							
27       28       29       30       31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50       51       52							
28       29         30       31         31       32         33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         51       52							
29       30       31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50       51       52							
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30       31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50       51       52	29						
32       33         34       35         36       37         38       39         40       41         41       42         43       44         45       46         47       48         49       50         51       52	30						
32       33         34       35         36       37         38       39         40       41         41       42         43       44         45       46         47       48         49       50         51       52	31						
33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         51       52							
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41       42         43       44         45       46         47       48         49       50         51       52							
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43         44         45         46         47         48         49         50         51         52	42						
44       45         45       46         47       48         49       50         51       52	43						
45         46         47         48         49         50         51         52	44						
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48 49 50 51 52	47						
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	50						
total no $N$ $\Sigma$ $a \times p$ $\Sigma$ $d^2 \times p$	51						
total no $\left  \begin{array}{c c} \mathbf{N} & \left  \sum a \times p \right  \\ \end{array} \right  = \left  \begin{array}{c c} \sum d^2 \times p \\ \end{array} \right $	52		**				D - 2
	total no		N N	$\sum a \times p$			$\sum d^2 \times p$

- 3. Calculate:
- a) the arithmetic mean for each researched index (waist, body mass, chest

$$M = \frac{\sum a \times p}{N}$$

b) mean square deviation for each researched index

$$\sigma = \pm \sqrt{\frac{\sum d^2 \times p}{N}}$$

c) the error of the arithmetic mean for each researched index

$$m = \frac{\sigma}{\sqrt{N}}$$
Body mass, kg

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	Body mass,	kg	Ι		1 /2 2 3 2		
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	№	Indices, a	Frequency, p	$a \times p$	(M-a)=d	$d^2$	$d^2 \times p$
4       5       6       7       8       9       10       11       12       13       14       15       16       17       18       19       20       21       22       23       24       25       26							
4       5       6       7       8       9       10       11       12       13       14       15       16       17       18       19       20       21       22       23       24       25       26	2						
4       5       6       7       8       9       10       11       12       13       14       15       16       17       18       19       20       21       22       23       24       25       26	3						
6 7 8 9 10 11 11 12 13 14 15 16 16 17 18 18 19 20 21 22 23 24 25 26							
7 8 9 10 11 11 12 13 14 15 16 16 17 18 19 20 21 22 23 24 25 26							
8       9       10       11       12       13       14       15       16       17       18       19       20       21       22       23       24       25       26							
9 10 11 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26							
10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26							
11       12         13       14         15       16         17       18         19       20         21       22         23       24         25       26	9						
12       13         14       4         15       5         16       6         17       7         18       8         19       9         20       9         21       10         22       10         23       10         24       10         25       10         26       10	10						
13       14         15       16         17       18         19       20         21       22         23       24         25       26	11						
14       15         16       17         18       19         20       21         22       23         24       25         26       26							
15       16         17       18         19       20         21       22         23       24         25       26	13						
16       17         18       19         20       21         21       22         23       24         25       26	14						
17       18         19       19         20       21         21       22         23       24         25       26	15						
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total no		N	$\sum a \times p$			$\sum d^2 \times p$
L	I	ı	1	1	l	L

$$M = \frac{\sum a \times p}{N} \qquad \sigma = \pm \sqrt{\frac{\sum d^2 \times p}{N}} \qquad m = \frac{\sigma}{\sqrt{N}}$$

Chest circumference, cm

№	Indices, a	Frequency, p	$a \times p$	(M-a)=d	$d^{2}$	$d^2 \times p$
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

11		•	•		
13       14         15       16         17       18         19       20         21       22         23       24         25       26         27       28         29       30         31       32         33       33         34       35         36       37         38       39         40       41         42       43         44       44         45       46         47       48         49       50         51       52	11				
14       15         16       17         18       19         20       21         21       22         23       3         24       3         25       3         26       30         27       30         28       30         29       30         31       32         33       34         35       36         37       38         38       39         40       41         42       43         43       44         45       46         46       47         48       49         50       51         50       51         52       52					
15       16         17       18         18       9         20       21         21       22         23       4         25       4         26       7         28       9         30       31         32       33         34       35         36       37         38       39         40       41         41       42         43       44         45       46         47       48         49       50         51       52	13				
16       17         18       8         19       9         20       9         21       22         23       9         24       9         25       9         30       9         31       9         32       9         33       9         34       9         39       9         40       9         44       9         50       51         52					
17       18         19       19         20       1         21       1         22       23         24       1         25       1         26       1         27       28         29       30         31       1         32       33         33       34         35       36         37       38         39       40         41       1         42       43         43       44         45       46         47       48         49       50         51       52					
18       19         20       30         21       32         23       32         24       32         25       32         26       32         27       32         28       32         30       31         32       33         33       33         34       35         36       37         38       39         40       41         41       42         43       44         44       45         46       47         48       49         50       51         51       52					
19       20         21       22         23       3         24       4         25       6         27       7         28       9         30       31         32       33         33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       9         50       51         52       8	17				
20       21         22       23         23       24         25       26         27       28         29       30         31       31         32       33         33       34         35       36         37       38         39       40         41       42         43       44         45       46         46       47         48       49         50       51         52       52					
21       22         23       3         24       3         25       3         26       3         27       3         28       3         29       30         30       31         32       33         33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         51       50	19				
22       23         24       25         26       27         28       29         30       31         32       33         33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         50       51         52       52					
23       24         25       26         27       28         29       30         31       32         33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         51       52					
24       25         26       27         28       29         30       31         32       33         33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         51       52	22				
25       26         27       28         29       30         31       31         32       33         33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         51       50	23				
26       27         28       29         30       31         32       33         34       35         36       37         38       39         40       41         42       43         43       44         45       46         47       48         49       50         51       52					
27       28         29       30         31       32         33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         51       52					
28       29         30       31         31       32         33       34         35       35         36       37         38       39         40       41         41       42         43       44         44       45         46       47         48       49         50       51         52       52	26				
29       30         31       32         33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         51       52	27				
30       31         32       33         33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         51       52					
31       32       33         33       34       35         36       37       38         39       40       41         41       42       43         43       44       44         45       46       47         48       49       50         51       52       51	29				
32       33         34       35         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         51       52	30				
33       34         35       36         37       38         39       40         41       42         43       44         45       46         47       48         49       50         51       52					
34       35         36       37         38       39         40       41         42       43         43       44         45       46         47       48         49       50         51       52					
35       36         37       38         39       39         40       41         42       43         43       44         45       46         47       48         49       50         51       52					
36       37         38       39         40       41         41       42         43       44         45       46         47       48         49       50         51       52	34				
37       38         39       40         41       41         42       43         44       44         45       46         47       48         49       50         51       52	35				
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41       42       3       43       44       44       44       44       44       45       46       46       47       48       48       49       40	38				
41       42       3       43       44       44       44       44       44       45       46       46       47       48       48       49       40	39				
42	40				
43       44       45       45       46       47       47       48       49       49       49       50       51       52       52       52       52       50 <td< td=""><td>41</td><td></td><td></td><td></td><td></td></td<>	41				
44       45       6	42				
44       45       6	43				
46	44				
47       48       6	45				
48       9	46				
50	47				
50	48				
51	49				
51	50				
	51				
	52				
	total no	N	Σι	$a \times p$	$\sum d^2 \times p$

$$M = \frac{\sum a \times p}{N} \qquad \sigma = \pm \sqrt{\frac{\sum d^2 \times p}{N}} \qquad m = \frac{\sigma}{\sqrt{N}}$$

4. Appreciation of the level of physical development of the **group of children**, comparing the data obtained with the arithmetic mean from the evaluation tables (the standards for children of the specific age taken into account).

Conclusion

5. Assessing the level of **individual physical development** in three children by themethod:

a) *sigma deviation* with the graphic representation of the physical development profile Parameters of physical development in three children

	Individual	Arithmetic	Mean	Deviation	sigma
Indices	data	mean,	square	from	deviation
		m	deviation,	on average	
			$\sigma$		
	а	b	С	d=b-a	$e = \frac{d}{c}$
	1.				
Waist	2.				
	3.				
	1.				
Body mass	2.				
	3.				
Circumference	1.				
	2.				
of the ribcage	3.				

Graphic representation of children's physical development profile

	-4σ	-3σ	-2σ	-lσ	M	+10	t +2c	+30	5 +40	5
Waist										
Body mass										
Circumferen ce of the ribcage										

### Appreciation of individual physical development

- average physical development deviations within  $\pm 1\sigma$ ;
- above-average physical development deviations within the range from  $\pm$  1.1 $\sigma$  to  $\pm$  2 $\sigma$ ;
- high physical development deviations within the limit from  $\pm 2.1\sigma$  to  $\pm 3\sigma$ ;
- subaverage physical development deviations within the limit from  $1.1\sigma$  to  $2\sigma$ ;

low physical development – deviations within the limit from – $2.1\sigma$ to – $3\sigma$ .

Conclusion
b) the regression scale
- 
Conclusion

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II. Establishing health groups	
Solving the homework problem	
Problem No	
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#### Practical work №

### THEME: The principles of protection for the use of ionizing radiation in medical units

### The purpose of the work:

✓ acquisition of actinic protection measures for the use of ionizing radiation in medicine.

### Report on the work performed

#### Note:

- 1. Division of patients by categories for performing radiological medical examinations.
- 2. Classification of critical organs.
- 3. The principles of radiation protection.
- 4. The formula for calculating the negative load index.

5.	Extract from HG no. 1025 of 07.09.2016 for the approval of the Health Regulationregarding the health supervision of persons exposed to the action of occupational risk factors.	•
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## Notes

