

LABORATORY NO. 1.

1.1. THE STUDY OBJECT OF HYGIENE

Definition. Hygiene is the science that studies the health condition (physical, mental and social) on humans.

It studies the external and internal factors, which work on health state.

The external factors are:

- environmental (abiotic) factors: air, water and soil;
- nutritional (biotic) factors: foods;
- school environment factors which affect the children' physical and psychological development and the main acute and chronic disorders appeared in the young community.

1.2. THERMAL SURROUNDING (MICROCLIMATE)

Definition. Thermal surrounding (microclimate) represents the total of the physical factors (temperature, humidity, air mobility, infrared radiation) which influence the changes between organism and environment.

There are 2 types of microclimate:

- warm microclimate;
- cold microclimate.

1.2.1. WARM MICROCLIMATE

Warm microclimate has the following conditions:

- increased temperature;
- increased humidity;
- diminished air movement;
- positive infrared radiation (the human organism receives heat from the environment).

1.2.2. COLD MICROCLIMATE

Cold microclimate has, in its turn, these conditions:

- diminished temperature;
- increased humidity;
- increased air movement;
- negative infrared radiation (the human organism loses heat in the environment).

1.3. THE TEMPERATURE DETERMINATION

1.3.1. CONDITIONS FOR TEMPERATURE DETERMINATION

The temperature is measured two times a year, in two seasons (warm and cold season), five days consequently, three time a day.

It is measured in all the four corners and in the center of the room, on three height levels: at 0,25 m from the floor, at 1,5 m (the middle distance), and at 0,25 m to the ceiling.

1.3.2. USABLE APPARATA

The apparata which is usually used for these determinations are:

- maximal thermometer that determines maximal air temperature at one established moment;
- minimal thermometer that determines minimal air temperature at one established moment;
- maximal and minimal thermometer (Six) that determines maximal and minimal air temperature at the same time, and at the same previous conditions;
- thermographe that determines air temperature for a period of time (a day, a week);

These four apparata measure the air temperature depending on the contraction and dilation of a metal (Hg) or liquid (alcohol).

- thermocouple that determines surfaces temperature at one fixed moment.

This apparatus measures surfaces temperature depending on the electricity formed in a circuit.

1.3.3. NORMAL AIR TEMPERATURE VALUES

Air temperature of the room must be between **18-22°C** for adults and **20-24°C** for children.

1.4. THE HUMIDITY DETERMINATION

1.4.1. HYGROMETER SIZES

Hygrometer size are:

- **Absolute humidity** - it's the quantity of water vapors in the air at a certain moment. It is marked with U_{abs} .
- **Maximal humidity** - it's the maximal quantity of water that exist in the air.
- **Relative humidity** - it's the ratio percentage between absolute and maximal humidity.

$$U_{rel} = \frac{U_{abs}}{U_{max}} \times 100$$

1.4.2. THE USED APPARATA

The apparata which we use for determining humidity are:

- Psychrometer;
- Hygrometer, Hygrograph;
- Gravimeter;

Psychrometer measures the humidity depending on the water vapors which are lost from wet substrate.

Hygrometer measures the humidity depending on the length of the blond hair.

Hygrograph has the same principle, but determines relative humidity in a period of time.

Gravimeter measures the humidity depending on the water weight retained in a substance with water affinity.

1.4.3. NORMAL VALUES

Relative humidity must be situated between 35% and 65%.

A relative humidity under 20% signifies dry air, and a relative humidity over 80% signifies wet air.

1.5. DETERMINING AIR MOVEMENT

1.5.1. USEABLE APPARATUS

The apparatus which is used frequently is catathermometer Hill.

This apparatus has the property to loose heat/cm surface and in the time unit proportional on air movement.

1.5.2. NORMAL VALUES

Normal values are between 0,1-0,3 m/s with a maximal accepted value of 0,5 m/s.

1.6. DETERMINING INFRARED RADIATION

1.6.1. THE HEAT CHANGE

When the organism looses heat and the environment receives it, the infrared radiation is ~~positive~~. *negative*

If the organism receives heat and the environment looses it, the infrared radiation is ~~negative~~. *positive*.

1.6.2. USABLE APPARATA

The apparata used for this determination is:

- actinometer Arago-Davis;

This apparatus measures infrared radiation depending on contraction and dilation of a metal (Hg) or a liquid (alcohol).

- actinograph;

This apparatus measures infrared radiation depending on contraction and dilation of a metal with different colours: white and black.

- thermo-electric actinometer.

This apparatus measures infrared radiation depending on the electricity formed in a circuit, and the sensitive piece is a disc from Ag.

1.6.3. NORMAL VALUES

For our health is accepted 1 cal/cm² corporal size/minute.

Differences between air temperature and wall temperature must be 4°C "+
"or "-.

Maximal temperature of the heat sources must be 80°C.

1.7. THE COMPLEX METHODS FOR DETERMINING MICROCLIMATE**1.7.1. TYPES OF METHODS**

We use three types of methods such as:

1. Physical methods - rarely used.

2. Physiological methods - which determines the reactions of the human organism depending on the microclimate influences.

We can determine:

- central temperature;
- peripheral temperature;
- cardiac frequency (internal pulse);
- sweat volume after gland function;
- the reaction time of the Central Nervous System.

3. Psychological methods

This method determine 2 parameters:

- Effective temperature;
- Effective corrected temperature.

These 2 parameters are expressed in $^{\circ}\text{Te}$.

1.7.2. PSYCHOLOGICAL METHODS

We meet two types of psychological method:

- relatively objective psychological method;
- subjective psychological method.

1.7.2.1. NORMAL VALUES FOR EFFECTIVE AND EFFECTIVE CORRECTED TEMPERATURES

During summer: $19-23^{\circ}\text{Te}$ with thermal comfortable point - 21°Te ;

During winter: $17-21^{\circ}\text{Te}$ with thermal comfortable point - 19°Te .

1.7.2.2. THE SUBJECTIVE PSYCHOLOGICAL METHOD

A subjective psychological method consists of estimating the three thermal scales.

There are:

- The scale with three steps:
 - warm;
 - comfortable;
 - cold.
- The scale with five steps:
 - noncomfortable warm;
 - comfortable warm;
 - pleasant;
 - comfortable cold;
 - noncomfortable cold.
- The scale with seven steps:
 - very warm;
 - warm;
 - a little warm;
 - pleasant;
 - a little cold;
 - cold;
 - very cold.

However, this is a subjective estimation, but is the first which we have made.