

PHYSICAL PROPERTIES AND HYGIENIC CHARACTERISTICS OF AIR IN CREATING A HEALTHY ENVIRONMENT

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Abstract

In this article, various factors of the environment and the impact of production activities on human health, work ability and life expectancy, the description of hygienic research and sanitation, the widely used methods of hygienic research, the use of toxicological and biological methods, hygienic characteristics, air cleanliness, industrial waste, transport, chemicals used in the home, patterns and respiratory diseases, effects on the cardiovascular system, lowering immunity, psychological effects, air exchange, providing fresh air, humidity control, thermal comfort, natural ventilation, mechanical ventilation, air cleaning systems are discussed.

Keywords: Labor capacity, hygienic research, toxicological and hygienic characteristics, air cleanliness, industrial waste, chemicals used at home, patterns and respiratory diseases, effects on the cardiovascular system, reduction of immunity, psychological effects, air exchange, fresh air supply, humidity control, thermal comfort, natural ventilation, mechanical ventilation.

Introduction

Factors of the external environment that have a permanent effect on a person include air temperature, humidity, movement, atmospheric pressure, air ionization. It should be noted that these factors are dynamic (changing) in contrast to the stability of the chemical composition of atmospheric air, and many of them have a complex effect on the body.

Air temperature. The human body works normally in a certain temperature range (36-37°C). The change in ambient air temperature has a great impact on the body. Cold weather can cause a drop in body temperature (hypothermia), and hot weather can cause overheating (hyperthermia). Extreme temperature changes affect the general functioning of the body, especially the cardiovascular and respiratory systems.

Warming of the air occurs due to the return of heat from the soil, which absorbs solar radiation and transforms it from one form to another. Although the air temperature in the atmosphere depends on the climate zone, season, time of day, intensity of solar radiation, etc., it always changes. The hygienic importance of air temperature is determined by its effect on heat exchange in the body. There are three main ways of giving heat to the external environment: sweat evaporation from the surface of the skin (when 1g of sweat evaporates, the body loses



about 2.5 kJ); transfer of heat to cooler objects by radiation; convection due to direct heating of air layers approaching the skin. A small amount of heat is given during breathing (when exhaling, the air heats up to almost body temperature) and through excretory organs. At home temperature, the body loses 45% of heat due to radiation, 30% due to convection and 25% due to evaporation of sweat. When the temperature of the air, walls, and surrounding objects increases, heat transfer by convection and radiation decreases, and heat transfer by evaporation increases. During heavy physical work at high temperatures, the amount of sweat released can reach 6-10 liters per day. When exposed to very low air temperature, heat transfer by radiation and convection increases significantly, and heat loss by evaporation decreases. Sudden and long-term changes in temperature cause overheating (when the air temperature is high) or hypothermia (when the air temperature is low).

Air humidity. A high or low level of humidity also has a significant effect on the body. In conditions of high humidity (90% and above), a person has difficulty reducing body temperature through sweating, which can lead to heat damage. Low humidity (20% or less) can cause problems such as dry respiratory tract, dry skin and dehydration.

Water vapor can be observed as the evaporation of water from liquids and gases on Earth. Evaporation of moisture on the surface of the lungs and skin, during washing, drying, etc., in living areas serves as an additional source of moisture. Air humidity means the amount of water vapor in the air. Like air temperature, humidity also changes depending on the climatic zone and season.

Hygiene is a science that studies the impact of various factors of the environment and production activities on human health, work ability and life expectancy. One of the most important tasks of hygiene is the development of preventive measures aimed at improving human living and working conditions. Hygiene serves as the scientific basis of preventive medicine.

Hygiene is closely related to all medical sciences, as well as to chemistry, biology, physics, mathematics, social sciences, etc. Hygiene is directly related to epidemiology, which is a wide application of hygiene recommendations and sanitary measures in the fight against infectious diseases will cry

Different widely used methods of hygienic research can be combined into two main groups:

- 1) methods of studying the hygienic condition of environmental factors;
- 2) methods that allow to evaluate the reaction of the body to the influence of one or another external factors.

Any hygienic research begins with a sanitary description. During the formation of the science of hygiene, this method was the only one, and it has not lost its importance even in the present time. This allows you to describe the condition of the observation facility, determine the size and nature of the necessary laboratory tests, with the help of which the sanitary condition is objectively assessed. However, sanitary description is not enough for a deep quantitative and qualitative assessment of environmental factors. Therefore, physical, chemical, bacteriological, toxicological, clinical, statistical and other methods are used.



Physical methods make it possible to assess the microclimatic conditions of buildings, measure noise and vibration parameters, the level of thermal radiation, etc.

Chemical research methods are used to analyze the air environment to determine the content of harmful substances, to assess the quality of water (its salt content, pollution indicators, etc.), to determine the biological value of food products, etc.

Currently, many physico-chemical and radiological methods are included in the practice of hygienic research. They are very sensitive, accurate and precise. In some cases, express methods (accelerated) are used. Chromatography-mass spectrometry, gas chromatography, atomic absorption, polarography and spectrophotometry are the most promising methods. They are used to detect and quantify chemicals in air, water, soil, biological materials, and other environments.

Bacteriological methods are used to assess bacterial contamination of air, water, soil, food products, and other objects that can transmit infectious agents.

Using toxicological and biological methods, especially in experiments on animals, the nature of the effects of chemical compounds on the organism is evaluated and maximum permissible concentrations (MAC), permissible residue levels (MRL) or maximum permissible levels in water, air and soil (MLL) chemicals are organized.

Clinical methods allow to determine changes in the body under the influence of environmental factors. This is done during clinical observation in hospitals and clinics or during clinical examination in the workplace.

Using epidemiological methods, it is possible to determine the consequences of environmental pollution on the population, to determine the quantitative size of the studied effects, to establish cause-and-effect relationships between biosphere pollutants and human health.

Sociological research and sanitary-statistical methods allow to analyze and determine a number of phenomena, in particular, the dynamics of natural movement of the population (birth, death, population growth), morbidity, physical development, etc.

The widespread use of various methods for studying environmental factors and public health in hygienic research allows for the scientific justification of the development of legislation, regulatory documents, hygiene rules and other measures aimed at ensuring sanitary-epidemiological stability and maintaining health.

In our country, the long-term development of the science of hygiene and sanitary-epidemiological services has been accepted, and it has been established by the principles of legal documents on the protection of citizens' health. One of the important provisions of this document is that the health of the society in modern conditions is determined by its sanitary-epidemiological peace, the real provision of the rights of citizens to a safe living environment and the prevention of diseases. Today, it is recognized that one of the most important factors of the country's national security is the protection of public health.



The epidemiological method includes

assessment of the health status of the population in terms of morbidity, damage, death, temporary loss of working capacity and disability

assessment of the prevalence of disease in different groups of the population in the area and over time

formation, evaluation and justification of hypotheses about the cause-and-effect relationship between the disease and its determining factors (risk factors)

proving hypotheses about risk factors and evaluating the effectiveness of disease prevention and patient treatment measures.

Health is a necessary condition for labor potential, the main criterion for the efficiency of state administration. In 1999, the law "On Sanitary and Epidemiological Welfare of the Population" was adopted in full accordance with these definitions and in order to implement them, which is the first time in our history. Regulation of public relations in the field of ensuring sanitary-epidemiological peace of the population was introduced at the legislative level as one of the main conditions for the implementation of the constitutional rights of citizens to protect the health and comfortable environment in the country. Great attention is paid to the following population health protection and improvement of living conditions: "On Protection of Atmospheric Air", "On Quality and Safety of Food Products", "Protection of Food Products to about".

Physical properties and hygienic characteristics of air are especially important in ensuring human health and quality of life. They include:

Physical properties:

1. Temperature: Air temperature affects comfort and health. Very high or low temperatures can cause health problems.
2. Humidity: Air humidity affects breathing and skin condition. High humidity can have a more negative effect than dryness.
3. Pressure: Air pressure plays an important role in the functioning of a healthy body. Low pressure can have its own effects at high altitudes.
4. Protein conversion: The presence of gases, dust and other particles as air. Protein purity and composition are important for respiration.

Hygienic characteristics:

1. Air cleanliness: The presence of pollution, chemicals or microorganisms in the air can adversely affect human health.



Air cleanliness is an important factor affecting human health. The presence of pollution, chemicals and microorganisms in the air can have several negative consequences:

Sources of pollution:

1. Industrial waste: Gases and wastes from factories mainly contain harmful chemicals.
2. Transportation: Cars, buses and other vehicles cause air pollution.
3. Household chemicals: Food cleaners, cosmetics and other chemicals can pollute the air.

Adverse effects:

1. Patterns and respiratory diseases: Air pollution can aggravate asthma, bronchitis and other respiratory diseases.
2. Effects on the cardiovascular system: Air pollution can increase the risk of heart disease.
3. Lower immunity: Polluted air can weaken the body's immune system and make it harder to fight infections.
4. Psychological impact: Air quality can increase negative emotions, stress and depression levels.

Microorganisms:

Airborne bacteria and viruses can cause the spread of infectious diseases. Fresh air and good ventilation will reduce this risk.

Clean air plays an important role in improving health and overall quality of life, so necessary measures should be taken to ensure a clean air environment.

1. Air circulation: Good ventilation provides fresh air inside buildings and rooms, which creates a healthy environment.

Air exchange is especially important in providing clean air inside buildings and rooms. Good ventilation includes the following aspects:

Importance of air exchange:

1. Provide clean air: Good ventilation cleans indoor air, removing harmful gases, chemicals and polluting particles.
2. Humidity Control: Air exchange controls humidity levels, which prevents mold and bacteria.
3. Thermal comfort: Fresh air circulation helps regulate room temperature, which increases human comfort.

Methods of air exchange:

1. Natural ventilation: Air exchange is ensured by opening windows and doors. This is a simple and economical method.
2. Mechanical ventilation: Forced circulation of air using ventilation systems. This method provides more control and efficiency.
3. Air purification systems: Purification of polluted air and replacement with clean air using filters and air purifiers.

Adverse effects:

Poor air circulation can cause breathing problems, allergies and other health problems. It can also negatively affect plant growth and indoor air quality.



Good air circulation is important in creating a healthy and comfortable environment, so steps should be taken to ensure this.

1. Particulate matter: Air particulate matter, such as PM2.5 or PM10, can harm human health. It is necessary to control their level.

Air particles, such as PM2.5 (2.5 micrometers and smaller) and PM10 (up to 10 micrometers), can pose a serious threat to human health. Their influence and control includes the following aspects:

About airborne particles:

1. PM2.5 and PM10: These particles can enter the respiratory system. PM2.5, in particular, can enter the alveoli (the smallest part of the respiratory tract) and enter the bloodstream, causing various health problems.

2. Sources: Sources of pollution include industrial waste, traffic, construction activities and even household substances.

Adverse effects:

1. Respiratory diseases: PM2.5 and PM10 particles can aggravate or cause asthma, bronchitis and other respiratory diseases.

2. Cardiovascular Disease: These particles increase the risk of heart disease, blood pressure and stroke.

3. Cognitive functions: Studies show that air pollution can reduce cognitive functions, which affects mental health.

4. Child development: Air pollution in children can have a negative impact on developmental processes.

Controlling:

1. Monitoring systems: Modern technologies and sensors are used to monitor air quality. These systems monitor pollution levels.

2. Measures: Take economic and ecological measures to reduce sources of pollution, such as switching to clean energy sources.

3. Encourage public transportation: Encouraging public transportation or walking instead of cars improves air quality.

Controlling the level of airborne particles is important in protecting health and providing quality living conditions.

1. Bacteria and viruses: Clean air is essential to reduce the risk of airborne infectious diseases.

Significance:

- Health care: Clean and suitable air conditions protect the respiratory system, cardiovascular system and other organs.

- Performance: Good weather conditions increase people's performance and focus.

- Improving the quality of life: Hygienic conditions and good physical properties make human life more comfortable and safer.



By improving the physical and hygienic properties of air, it is possible to maintain health, improve work performance and improve the quality of life.

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