

Occupational hazards in professional activity of doctor.

Working conditions are a set of environment factors that affect health and human performance in the process of its activities.

For a more complete definition, conditions of work is a complex social phenomenon, which is influenced by socio-economic, technical, institutional and natural factors that affect health, the health of a person, his attitude to work and quality of life.

The factors that shape working conditions?

The factors that shape working conditions can be divided into four groups:

sanitary-hygienic elements of the external environment: climate, noise, radiation, vibration, lighting and etc. This group of factors is specific, just fixed the levels, values, and parameters;

physiological elements: the working posture and physical and neuro-psychological load. For the majority of factors of this group still there are no common standard units of measurement;

aesthetic elements - design of workplace, tools, etc. Indicators in this group are evaluated using various expert estimations.

socio-psychological features determine the nature of the working conditions: working hours, work regime and recreation, benefits and compensations for work in harmful conditions and psychological climate in which the labor process.

The hardness of work is the characteristic of the working processes reflecting predominant loading on the locomotor apparatus and functional systems ensuring its activity.

Intensity of work is the characteristic of the working process reflecting predominant loading on the central nervous system.

According to the "Hygienic classification of work by indicators of harm and danger environment factors, severity and intensity of labor process", approved from Ministry of health of 27.12.2001 № 528 the class of labour conditions is determined by the factor of the production environment, intensity or severity of the labor, which has the largest deviation from regulatory requirements.

Based on the principles of Hygienic classification of labor, the terms are distributed into 4 classes:

Modern hygienic classification of labor is based on these main characteristics. There are four classes of conditions and character of labor.

The first class is characterized by optimum conditions and character of labor. Unfavorable influence of harmful and dangerous production factors on workers' health is excluded.

The second class is characterized by permissible conditions and character of labor. Levels of harmful and dangerous production factors do not exceed the hygienic norms and do not render.

The second class includes permissible levels of harmful and dangerous industrial factors, which do not exceed hygienic standards. They do not render unfavorable action on the workers' health and state of health of their descendants.

The third class is harmful and dangerous factors, which exceed hygienic norms and rules (including psychological factors of labor activity). These factors render stable disturbances of functions of the organism, make worsen of health and decrease of capacity for work.

The third class includes four degrees of industrial conditions and character of labor.

The first degree is conditions and character of labor, which render functional disturbances in the workers' organism. These disturbances disappear, when influence of industrial factors is stopped.

The second degree includes industrial conditions and character of labor, which render stable functional disturbances; as a result general morbidity of workers increases, at the same time early forms of occupational diseases appear.

The third degree is conditions and character of labor, which can cause early stages of professional diseases and increase of general morbidity.

The fourth degree of labor conditions is characterized by high level of general morbidity of industrial workers and high level of professional pathology.

The fourth class is extreme conditions of work. Real danger beginning of serious acute diseases, professional lesions and occupational poisonings happen. These conditions create high risk for workers' life.

For prophylaxis of unfavorable influence industrial condition for workers' organism it is necessary to know that there are the dangerous and harmful factors at the industrial enterprises.

The harmful production factor is a factor whose influence on the worker under the certain conditions can result in the disease or stable decrease of capacity for work.

The dangerous production factor is a factor whose influence on the workers under the certain conditions can result in a trauma or other sudden sharp worsening of health.

These factors can be of the physical, chemical, biological nature. The wrong regimen of the working day, irrational arrangement of the working place not corresponding to industrial equipment can also have harmful and dangerous influence on the workers' organism.

Dangerous industrial hazards

According to this standard all dangerous industrial hazards are divided into 4 groups: physical, chemical, biological and psycho-physiological.

Industrial physical hazards are:

- movable machines, mechanisms, unprotected movable elements of production equipment, feedstock, materials, goods that move, other mechanical agents;
- hot or cold microclimate of the working zone, high levels of infrared radiation (hot shops in metallurgy industry, boiler shops etc.), hot water or steam;
- increased or decreased barometric pressure and its leaps;
- high noise level, vibration, infra- and ultra-mechanical fluctuations of air or hard surfaces;
- high levels of radio region electromagnetic oscillations, electric magnetic fields of commercial frequency, static electricity;
- high levels of ionizing radiation (X-radiation, gamma-radiation, corpuscular radiation);
- insufficient or excessive illumination of work places, low contrast, high luminosity, its dazzle, unevenness, pulsation of the light, stroboscopic effect;
- high dust content in the air, fuel and explosive gases (methane in the coal mines).

Group of chemical dangerous industrial hazards includes:

- according to their action on organism - irritant, general toxic, sensibilizing, carcinogenic, mutagenic and teratogenic;
- according to their penetration route into organism: through respiratory tract, digestive system, skin (chemical burns);
- according to their tropism: pneumo-, neuro-, hepato-, hemato-, nephro-, dermato- and polytropic;
- according to level of toxicity: extremely toxic (MAC in the air $< 0.1 \text{ mg/m}^3$), highly toxic (MAC $0.1 - 1.0 \text{ mg/m}^3$), medium toxic (MAC $1.0 - 10.0 \text{ mg/m}^3$), low toxic (MAC $> 10.0 \text{ mg/m}^3$).

Group of biological dangerous industrial hazards includes those biological objects, which impact on the workers causes diseases, poisonings and injuries:

- zoonotic bacterial, viral, fungal infections (anthrax, foot-and-mouth disease, Bovine Spongiform Encephalopathy (BSE), tularemia), invasions, allergies (from animal and plant dust) etc.;
- plant toxins and venoms (like snake hunters) etc.;

- biological production objects: antibiotics, protein-vitaminous concentrates, growth agents, bioactive preparations etc.

Group of psycho-physiological industrial hazards includes:

- excessive physical activities: static (hold of heavy loads); dynamic (lifting and displacement of heavy loads and their intensity); hypodynamia, forced body position, overstrain of some organs;

- neuropsychic overstrains: mental overstrains, overstrains of attention and analyzers, very rapid change of production processes, information, work monotony, psychological and emotional overloads (like “chief- subordinate” interrelations).

According to the character and extent of energy expenditure, physical labour is characterized by its weight and intensity, and mental activity, like operator’s – by its intensity.

According to the State Standard 12.1.005 – 88 “General hygiene and sanitary requirements for air in the working zone” physical labour is divided into light one (energy expenditure – below 150 large calories per year), medium complexity (150 – 200 large calories per year), heavy one (200 – 250 large calories per year), and very heavy labour (> 250 large calories per year).

According to its tension, mental, operator’s work is divided into: non-tensioned, slightly tensioned, tensioned, super tensioned.

Of particular importance is the assessment of working conditions, which is the basis for the adoption of the measures necessary to prevent risks or reduce them to a minimum.

Health care facilities around the world employ over 59 million workers who are exposed to a complex variety of health and safety hazards everyday including:

- biological hazards, such as TB, Hepatitis, HIV/AIDS, SARS;
- chemical hazards, such as, glutaraldehyde, ethylene oxide;
- physical hazards, such as noise, radiation, slips trips and falls;
- ergonomic hazards, such as heavy lifting;
- psychosocial hazards, such as shiftwork, violence and stress;
- fire and explosion hazards, such as using oxygen, alcohol sanitizing gels; and
- electrical hazards, such as frayed electrical cords.

In accordance to the listed agents of industrial hazards “List of occupational diseases and instruction for its application” was approved by the Order № 23/36/9 from 2.02.1995 of the Ministry of Social Policy and Ministry of Labour.

Occupational diseases are adverse health conditions in the human being, the occurrence or severity of which is related to exposure to factors on the job or in the work environment.

Injury (gr. trauma - damage, injury) is a violation of the anatomic integrity of the organism or its functions as a result of sudden short-term effect of any external

factors (mechanical, chemical, thermal etc.) resulting in comes temporary or permanent disability.

Occupational diseases caused solely by industrial and occupational hazards, their consequences in the near and distant future as well as consequences of non-occupational diseases caused by occupational hazards (like arterial hypertonia caused by vibration) were put on the list.

Acute and chronic occupational diseases and poisonings are recognized.

Acute occupational disease (intoxication) begins suddenly, after only one impact of a relatively high concentration of toxic chemical agents (during one shift) in the air of the working zone or levels or doses of other hazards.

Chronic occupational diseases occur as the result of long-term exposure to low (but exceeding MAC, MAL, MAD) concentrations, levels and doses of occupational and industrial hazards.

According to approved “List...” occupational diseases are divided into 7 groups:

1. diseases caused by chemical agents: acute and chronic intoxications of different tropism (neuro-, hemo-, hepato-, nephro-, poli-, dermatotropic, allergic etc.);

2. diseases caused by industrial particulate pollutants: black-lung diseases, dust bronchitis, rhino-pharyngolaryngitis, allergies;

3. diseases caused by physical agents: ionizing radiations (acute, chronic radiation sickness, local radiation injuries, long-term consequences – malignant tumors); non-ionizing radiations (laser, ultraviolet, infrared); decompression - caisson sickness; acute, chronic overheating; noise, vibratory diseases etc.;

4. diseases caused by overload and overstrain of certain organs and systems: coordination neurosis (at milkmaidens, violin players, linotypers), radiculitis, tendovaginitis, arthrosis, bursitis, thrombophlebitis; laryngitis at singers, teachers, progressive myopia etc.;

5. diseases caused by biological agents: infectious and parasitogenic diseases at stock-breeders, vets, infectiologists, bacterial laboratory assistants etc.;

6. allergic diseases: conjunctivitis, rhinitis, bronchial asthma, dermatitis, eczema, urticaria etc., that occur when one works with corresponding agents of plant or animal origin;

7. neoplasms – malignant tumors when working with carcinogenic substances of physical (ionizing radiations, ultraviolet radiation) and chemical (3, 4-benzpyrene, resins etc.) origin.

Preventive medical measures must include:

- participation in development of technical and engineering sanitation of working conditions (airing, packaging, automation, mechanization, remote control etc.);
- scientific development of hygienic regulations, different sanitary legislation; Industrial Engineering (IE);
- preventive and running check by sanitary inspectors;
- health education and preventive work in the work collective (teaching sanitary regulations, use of overalls and personal protectors, clinical and preventive nutrition, water consumption schedule).

Professional activity of HCW can be divided into:

- 1) work of physicians and pharmacists;
- 2) work of nursing and pharmaceutical personnel (nurses, medical assistants, dental technicians, and others);
- 3) junior medical staff (nurses).

There are certain medical and nursing specialties:

1. Therapeutic specialization.
2. Surgical specialization.
3. Dental specialization.
4. Hygienic specialization.
5. Pharmaceutical specialization.
6. Special methods research, etc.

Nurses' labor is very complicated, multivarious and hard. It makes high demands to the organism of a nurse. For successful medical and diagnostic work it is necessary to create an optimum work conditions for a nurse.

There are many negative factors of the environment influence the organism of nurses of different specialties.

These factors are connected with the use of sophisticated medical apparatus, numerous drugs, various working factors, etc.

Different types of nurses' labor have a lot of common features. They are nervous and psychic stress. It is connected with moral and juridical responsibility for life and health of the patient. It is especially true about nurses in surgery, obstetrician and gynecology, experts of narcology, psychiatrists, and nurses of ambulance; to the less degree it can be said about therapy, district pediatriation, surgery, obstetrician and gynecology working at polyclinic.

Necessity of making emergency decision in condition of extreme lack of time is typical for nurses' work. Very often there is lack of information about patient (for example, a shock patient, serious stroke, infarction, and so on). Frequent and night calls are typical for nurses of different specialties. Disturbance of regimen of work

and rest is the result of night calls, night duties and 24-hour duties. This situation results in disturbance of biorhythms of human. Increased physical activity, very often an unlimited working day, disturbance of night sleep, connected with night duties are characterized nurses' work. Traumatism possibility is prevalent for nurses of ambulance, experts in narcology and psychiatrists. Nurses have different risk factors of various etiology.

Physical factors, among which most frequent is unfavorable microclimate. Nurse is surgery undergo the action of this factor during their work for a long time in the operating room, as well as district nurses, nurses of ambulance.

Nurse in radiology, roentgenology, surgeons, traumatic surgery undergo the action of ionizing radiation during roentgenological examinations of patients.

Surgeons undergo the action of higher atmospheric pressure during carrying out operations on the heart, large vessels and other operations, connected with high risk in the barooperating rooms. Pressure in barooperating room is about 2-3 atmospheres. Surgeons work in atmosphere, which contains pure oxygen.

Noise connected with work of different apparatus and machines (for example, apparatus of mechanical lung ventilation) is a factor of nurses' labor. Sometimes noise reaches 60-70 dB. Nurses in physiatic undergo the action of ultra-violet radiation.

Laser-radiation is widely used in surgery, ophthalmology and other branches of medicine.

Electro-magnetic fields influence surgeons, psychiatrists during their work.

Chemical factors influence the nurses' organism. Air of hospital premises is polluted by chemical substances (ozone, nitrogen oxides, antibiotics, narcotic substances). Sixty percent of all professional diseases of nurses are connected with chemical substances. Chemical substances can cause allergic diseases, bronchial asthma, rhinitis, bronchitis, allergic miocarditis, dermatitis, etc.

Biological factors. Infectious danger is peculiar to all nurses. Diseases of nurses connected with biological factors make up 30 % from total number of diseases; the other diseases make up 10%.

The influence of negative factors causes a specific picture of nurses' morbidity. Very often nurses have diseases of respiratory system, circulatory system, alimentary canal, urogenital system, etc.