

Lecture.

Current issues of hygiene of children and adolescents.

Bioethics and biosafety in the hygiene of children and adolescents.

The Subject and tasks hygiene of children and adolescents (HCA).

preventive medicine that studies the conditions of the environment and children's activities and their impact on the health and functional status of the growing organism.

HCT is the section of hygiene studying action factors of environment on a growing organism and developing preventive actions for preservation and strengthening health of children and teenagers.

The growth is the process of quantity increasing the size and weight of body.

The development is quality changes associated with the processes of differentiation and morphogenesis.

Primary aims HCT:

- studying physical development,
- development hygienic requirements to children's preschool and school establishments, to hardening, to physical training children, to children's toys,
- hygiene of work of schoolboys and teenagers,
- hygiene of feed of children,
- realization medical - professional consultations at school.

Sections of hygiene of children and adolescents

Preschool hygiene

School hygiene

Hygiene of youth

Hygiene of children and adolescents with defects of development - blind and poorly seeing, deaf and poorly hearing etc., learning in special educational institutions.

Main problems of HCA:

- Condition of health and physical development;
- Age periodization.
- Hygienic fundamentals of educational process;
- Hygienic fundamentals of physical education;
- Hygiene of labour activity of children and adolescents;
- Sanitarian implementation of buildings for the children's establishments (lay-out of premises and sanitarian implementation of buildings and territories, antiepidemical measures).

Child health formation

The basic methods of research in HCA.

1) epidemiological method (studying state of health of children's contingents depending on factors of environment);

2) method of the sanitary description (sanitary inspection children's preschool establishments, schools etc.);

3) method of sanitary examination (examination children's toys etc.);

4) methods of laboratory experiments (for example, studying influence of harmful factors on a growing organism in experiments at laboratory animals).

The factors, forming health and physical development of children and adolescents

Natural and climatic

- National, racial and population

- Individual heredity (chromosomal illnesses)

- Social (economic situation, environmental situation, lifestyle and nutrition in the first place, war and terrorism, the family, living conditions and education, etc.)

PHYSICAL DEVELOPMENT of children and adolescents

Physical development is the complex of the morphological and functional attributes, determining growth, formation organism of the child, stock of its vital forces, endurance and capacity.

Physical development is one of the major parameters describing state of health of the population, and influence on it various factors.

For estimation health of children's contingents this parameter is used most frequently together with disease.

The purposes of research physical development:

- revealing laws of growth and development;
- estimation individual and population level of health;
- studying influence factors of environmental, social environment, genetic factors;
- estimation efficiency of treatment-and-prophylactic measures.

Parameters of physical development (PD)

PD is a degree of morpho-functional indications development, which speaks about conformity of growth and development on each age period of life to the certain standard.

Standards are established by the result of regular medical examinations.

Schemes of age periodization.

The biological periodization accepted in HCT:

The period of new-born (1-10 days);

Baby age - till 1 year;

Earlier childhood -1-3 years;

The first childhood - 4-7 years;

The second childhood - boys 8-12; girls - 8-11 years;

Teenage age - boys 13-16; girls - 12-15 years;

Youthful age - young men 17-21; girls -16-20 years.

Social age periodization:

prepreschool age - till 3 years;

preschool - 3-7 years;

younger school - 7-10 years;

average school -11-14 years;

elder school - 15-18 years.

Laws of growth and development children

- Non-uniformity growth and development depending on age - than younger organism, that these processes go more intensively;

- Non-uniformity growth and development of different bodies and systems in different age;

- Connection growth and development with a sex - unequal rates of growth and development at boys and girls;

- Influence on growth and development genetic factors, environmental factors and social conditions, diseases;

- Influence of acceleration.

Signs of the harmonious development of boys and girls are:

Physical well-being - good physical condition of the body, which coordinated all organs are functioning. It easily adapts to environmental changes, actively resists disease;

- Mental well-being - the ability to perceive the world around;

- Social welfare - understanding in relations with the people who surround them;

- Spiritual well-being - the desire to be the person responsible for themselves and others to do good deeds.

Acceleration as actual problem HCT.

Acceleration is increasing physical development of children and teenagers by comparison with anthropometrical parameters of children many years ago.

Last 10-15 years rates of acceleration decreased and even there is deceleration - decreasing physical development of children and teenagers by comparison with anthropometrical parameters of children 10-15 years ago.

Theories (reasons) of acceleration.

Till now the universal reason of acceleration is not established in view of big amount of the factors influencing physical development. The basic theories:

- 1) Improvement qualitative and quantity indicators of a feed of the population - alimentary theory;
- 2) Decrease disease, gynecologic pathology because development of medicine;
- 3) Geliogenic theory - influence of cyclic changes solar activity and levels UVR;
- 4) Ecological - growth contents CO₂ in an atmosphere, increase intensity of electromagnetic fields, increase level of natural radioactive level;
- 5) Theory geteresis - increases mixed marriages of different races and nationalities.

Medical and social consequences of an acceleration

Medical adverse consequences:

- rejuvenation many diseases (oncological, cardiovascular etc.);
- functional violations development of bodies and systems;
- problem of a large fruit in obstetrics due to an intra-uterine acceleration;
- necessity revision hygienic norms (of feed, the sizes of school furniture, standards of physical development);
- gynecologic pathology because of early pregnancy and abortions.

Social consequences, caused by backlog of mental development from physical: growth teenage criminality, growth number of divorces, many children without care of parents etc.

Deceleration

Deceleration = Retardation

It is the slowdown of growth, development, puberty.

“The growth spurt” of postnatal period

PERIOD of LIFE	INDICATORS
The first year old	1.5-fold increase in the length of the body
5-6 years	3-4-fold increase in body weight (mainly due to the growth of the trunk) “waist high spurt” – growth of child reaches 70% of the length of the adult mainly due to the limb
13-15 years	Pubertal growth spurt by extension of the trunk and limbs

PHYSICAL CHARACTERISTICS of ADOLESCENTs TODAY

Reduced functionality and security features

Disharmony development

Slow down puberty

Changing the weighted-growth indicators

The tendency to short stature

Regularity of the medical examinations:

Children till 1 year: monthly;

- From 1 year up to school: 4-2 times per one year;
- School students: 2-1 times per one year.

Standards of physical development are set in groups that differ by sex and age, in the population at a sample of at least 100 people (modern requirements for sample size - at least 1000 people).

Implementation of standards is limited to population and time period.

Groups of health (1)

1 group (healthy children, without deviations):

- Children who are not have of chronic diseases;
- Children who were not sick or supervision, seldom sick for the period (1-3 times per the last year);
- Children have normal, natural and psychological development for this age;

2 group (healthy children, but with morphological deviations and (or) by the reduced resistance of an organism):

- Children who are not suffering by chronic diseases;
- Children have some functional and morphological deviations;
- Children sick frequently (4 times per a year and more) or long duration (more than 60 days on one disease);

3 group (patients in a condition of compensation):

- Children have chronic diseases or with an inherent pathology in stage of compensation (without expressed violation of a general condition and state of health);

4 group (patients in a condition of subcompensation):

- Children have chronic diseases or with an inherent pathology, defects of development in stage of subcompensation;

5 group (patients in a condition of a decompensation):

- The patients with heavy chronic diseases in stage decompensation;
- Children with significant reduction of functionalities.

Methods research physical development.

Requirements to methods of research:

- application simple and accessible techniques,
- realization researches in one time (it is better - in the morning after dream),
- sufficient accuracy of measurements.

1. Somatometrical (anthropometrical) - growth, weights of body and circumference of chest.

2. Somatoscopical - the description the form of skeleton, backbone, chest, legs, development of muscles, state of skin, sexual development by Tanner criteria.

3. Physiometrical - vital capacity of lungs, excursion chest, muscular force, arterial pressure, pulse.

[Слайд 23]

HYGIENIC REQUIREMENTS to CHILDREN'S PRESCHOOL ESTABLISHMENTS (CPE).

Kinds of CPE: kindergarten (for children 3-7 years), a day nursery (till 3 years), children's combine (day nursery + kindergarten), children's home, the preschool children's home, specialized CPE for children with infringements of development, preschool improving establishments for summer holiday.

Requirements to choice site of CPE

- Availability - radius of service - 300 m;
- Optimum hygienic conditions on the site (optimum microclimate, absence of air pollution by chemical and physical factors, presence of green plantings).

Requirements to site of CPE:

1. The area of site is 30-40 m² on 1 child.
2. 2 entrances are main and economic, the form of site - rectangular.
3. Functional zones - principle of group isolation:

- A zone of building;
- A zone of group play-grounds;
- A zone of sports-ground ;
- An economic zone;
- A zone of green plantings.

Requirements to functional zones.

ZONE of BUILDING. Systems of building CPE:

- centralized (not good - all groups and economic premises(rooms) -in 1 building),
- decentralized (many buildings, need a lot of the place, expensive construction),
- block (modern projects - the block of day nursery, kindergarten, gymnasium, the economic block).

The building - is not closer 25 m from border of site, is surrounded with green plantings (trees - not closer 10 m, bushes -5m from a building - normal natural light exposure).

ZONE of GROUP PLAY-GROUNDS

Group platforms must have square 7,2 m² on the 1 child, a shadow canopy 40 m², the game and sports equipment according to age. Calculation necessary amount of platforms - 1 platform for 2 day nursery groups or for 4 kindergarten groups. Platforms are separated by zone of green plantings.

ZONE of SPORTS PLATFORMS

2 sports platforms 150-2.50 m² - separately for younger and senior age groups, there are racetracks, other sports equipment.

ECONOMIC ZONE

It is located in a distant part of a site, is closer to economic entrance, must be separated by green plantings.

ZONE of GREEN PLANTINGS

Should occupy not less than 50 % of the area of a site. Among plants there should not be with the prickles, rendering irritating and allergenic action, poisonous wild-growing plants.

REQUIREMENTS To the LAY-OUT of BUILDING CPE

Major principle is group isolation:

- prevention infectious diseases opportunity of quarantine actions;
- various mode of day in different age groups;
- prevention traumatism at association children different age.

The building - is not higher than 2 floors, the basic groups of premises: group cells, general purpose premises, medical premises, administrative.

HYGIENIC REQUIREMENTS To the GROUP CELL

Basic functional part CPE - the set of premises intended for 1 group of children.

Structure: a reception - locker room, a group room (or separately game, a bedroom, a dining room), buffet, a bathroom, a verandah (for day nursery groups).

Reception - locker room - the area 18 m², cases for outer clothing, benches, racks for the toys used on walks. In day nursery groups are swaddling clothes tables and tables for feeding children by mothers.

Group room is the common room or is divided into a game room and a bedroom. The general area is 4 m² on 1 child.

Hygienic requirements:

- microclimate - temperature of air 21-22 °C (day nursery) or 18-20 °C, humidity 40-60 %, speed of movement of air 0,1-0,3 m/s.

Ventilation: frequency rate 3, volume on 1 child 20 m³/hour, CO 2-up to 0,1 %.

Illumination: natural - LC 1/4-1/5, CNI -1,5 %, a corner of falling on tables 27°, a corner of an aperture - 5°. Artificial - common illumination -150 lux.

Buffet - 3 m² -for distribution of food, washing and storage of utensils.

Bathroom - 12-16m².

General purpose premises: gymnastic and a music hall (75 m²), a methodical study, additional: a swimming pool, visual hall, a study for manual skills and drawing.

Medical premises: a medical room, a procedural study, isolator.

Administrative: a study of the manager with a hall for realization meetings with parents, a wardrobe for the personnel, washing and ironing, eating establishment.

HYGIENIC REQUIREMENTS To the EQUIPMENT In PCE

Hygienic requirements to children's furniture:

- conformity to the anthropometrical sizes of children, trauma safety,
- must be made of not toxic materials (from tree),
- covered with nontoxic paints, a smell of paint - not more 1 point.

Hygienic requirements to toys in PCE:

1. Weight: till 3 years - up to 100 g, 3-7 years - 400 g, more than 7-10 years - 800 g,
2. The sizes of fine details till 3 years - not less than 3 sm (may be aspiration small details).
3. Their material is food grades of rubbers and plastic. Paints must be nontoxic, steady to disinfection, a smell of paints till 3 years -1 point, 7 years - 2 points.
4. Application the toys which are badly can be disinfected (soft toys) is not recommended.
5. An electric voltage in electric toys - up to 12 Volt.

Physical, psychological and physiological peculiarities of children and adolescents depending on age.

During the first years of life the child has improved CNS activity. There is rapid formation of conditioned reflexes.

For preschool children slight decline in growth and a slowdown in the ossification process, formation of language ends, vision rapidly develops, hearing, thermoregulation processes are characterised.

In primary school during the growth and development of the child ceases intense increase in the mass of brain tissue, motor analyzer is improved, the movements become more coordinated. Adaptation to environmental conditions is intensively developed.

Middle and high school age is characterized by a total restructuring of the organs and systems, significant intensification of growth and development of the organism.

The peculiarity of this age is puberty, which is characterized by mental lability, autonomic nervous system abnormalities in function of the cardiovascular system. Processes of the cerebral cortex, ossification, development of skeletal muscles are intensified.

Changes in the body, inherent to children during their growth and development, require compliance with all hygiene rules and regulations dictated by their age characteristics.

Physical development is characterized by continuous biological processes at every age stage. This set of morphological and functional properties of an organism inherent in the process of growth and formation.

Physical development and other health indicators reflect the state of health of children's groups and the general population.

Individual assessment of the physical characteristics gives an entire group.

School hygiene or school hygiene education is a healthcare science, a form of the wider school health education. School hygiene is a study of school environment influence; it explores affection of schooling to mental and physical health of students.

Schools can determine children's health and well-being by their exposure to a healthy or unhealthy school environment.

Schools have a central place in the health of a community. Inappropriate hygiene in schools can cause many diseases. If there are no school sanitation and hygiene facilities, or if they aren't maintained and used adequately, schools become places where diseases are likely transmitted.

There are a lot of architectural and aesthetic aspects related to a school's hygienic needs, such as: school's building plan, safe water supply, disposition of waste, emergency lighting, heating and ventilation, as well as adequate school facilities (halls, classrooms, and common areas) and furniture.

School location

Due to health reasons (influence of noise, exhaust gases from vehicles, and potential risk of accident), schools in an urban and suburban areas should be located more than 100 meters away from major traffic and causeways. Some studies suggest it is best to orient and design a school building so that natural light can be a part of the lighting scheme of the school, and that buildings should avoid being placed in a valley, due to air quality issues.

HYGIENIC REQUIREMENTS To SCHOOLS.

Requirements to accommodation;

availability (radius of service 1,5 km in city and 3 km - in village);

optimum hygienic conditions in a place of a site. Requirements to a school site

The area is 20-50 m² on 1 pupil, the rectangular form.

Functional zones of school site:

- A zone of building (a school building);
- A zone of rest;
- A educational-skilled zone;
- A sports zone;
- Economic;
- Green plantings

The zone of building - building - is not closer 25 m from borders of a site, is surrounded with a strip of protective green plantings (not closer 5-10 m from a building - natural illumination at 1 floor).

Zone of rest - 2 platforms for outdoor games for younger and senior classes, a platform for silent rest, a bench.

Educational -skilled zone - a garden, a kitchen garden, hothouses, educational workshops etc.

Sports zone - stadium with racetracks and holes for jumps, a platform for volleyball, sports shells etc.

The economic zone - at the end of a school site is closer to an economic entrance, is separated by green plantings.

Zone of green plantings - not less than 40-50 % of the area of a site.

Requirements to a school building.

Systems of school construction:

- centralized (in one building - old projects - high level of infections, noise, air pollution),
- pavilion type (many small buildings, it is accepted now for schools of sanatorium type),
- block type (blocks for younger, average, senior classes, a sports hall, a housekeeping).

The basic groups of premises in school:

Educational section, a general purpose premise (a lobby, a wardrobe, a dining room, a sports hall, an assembly hall, library etc.), office accommodations (studies of the director, teachers, a first-aid post, eating establishment).

The basic functional unit is educational section - classes or studies, a zone of recreation (hall, corridor), a bathroom. Unilateral building of a school corridor with windows and halls is optimal.

Hygienic requirements to a class room at school.

The area is 1,25 m² on 1 pupil, as a whole not less 50 m². Microclimate - as for premises, frequency rate of ventilation - 4, volume 20-30 m³/hour on 1 pupil, concentration CO₂ in air not more 0.1 %. Requirements to illumination are very important:

- Natural: LC 1/4-1/5, CNI - 1,5 %, a corner of falling 27°, corner of aperture - 5 °;
- Artificial: common illumination 150 lx (luminescent lamps - 300 lx).

Requirements to an arrangement of school desks (educational tables):

In class must be desks not less than 3 sizes placed in 3 lines, distance between lines 0.8 m, up to a school board 2.5 m, up to walls 0.5 m; distance school desks from windows - observance norms of corners of falling and an aperture.

Hygienic requirements to educational laboratories.

Laboratories chemistry, physics, biology. The area 70-100 m², have laborant room 6 m², it is better to place it on the top floors of school building (better airing), should be equipped with artificial ventilation, waterpipe for washing utensils and the equipment.

Advantages and lacks of laboratory system building school.

Advantages: it is easier to concentrate, the equipment and a didactic material in 1 -2 studies and not transfer it to different classes.

Lacks: the big counter streams of schoolboys on changes (infection), reduction time of recreation, discrepancy of furniture to anthropometrical parameters of schoolboys of different age.

Requirements to a sports hall at school.

It is better to have it on 1 floor, at block system of construction -in the separate block (noise prevents lessons in other classes). The area - 4 m² on 1 pupil, height 4,5-6 m should be a locker room and material for storage of stock. Feature of a microclimate - air temperature 16 degrees (overheating of children at intensive physical activity), frequency rate of ventilation 4-5.

Hygienic requirements to school furniture:

- Conformity to the anthropometrical sizes of children (prevention infringements of the skeleton and eyes)

- trauma safety;

- nontoxity materials and dyes, stability to disinfection;

- Light or green colouring tables.

The sizes of school desks (tables).

In each class - not less than 3 sizes, at schools are used desks 6-12 sizes having multi-coloured marks for the teacher.

In the beginning education the teacher should distribute schoolboys on the sizes (ruler Flerov or under formula Listov: N° school desks = 2 first figures of growth - 5).

Hygienic specifications of school furniture:

1. Differentiation - vertical distance from a table to chair = 1/7-1/8 growth or from the lowered elbow to sitting

2. A distance of sitting - horizontal distance between edge of table and edge of sitting = - 4-5 sm.

3. A distance of back of chair - horizontal distance from edge of a table up to back of sitting = front-back section of a body + 3-5 sm

4. Height of sitting - length of a shin + 2 sm