

Seminar 17.

Theme “Commodity analysis of medical devices, personal hygiene items and means, sanitary and hygienic products, spectacle optics, mineral waters.1 Main stages, methods of implementation. Registration of the results of commodity analysis.

Questions for theoretical discussion

1. Assortment list of medical products, items for patient care, prevention, sanitation and hygiene for pharmacies. Classification of sanitary and hygienic products and means for the care of the sick and children.

2. Classification, general characteristics of rubber products and latex products. Manufacturing methods, types. Features and rules for the storage of rubber products.

3. Characteristics of groups of sanitary, hygiene and patient care products according to their functional purpose.

4. Classification of spectacle glasses. Spectacle glasses types. Requirements for the quality of spectacle glasses. Checking their quality.

5. Specialized food products. Classification. General characteristics.

6. Biologically active additives. General characteristics. Parapharmaceuticals, nutraceuticals, probiotics, prebiotics.

7. Disinfectants, general characteristics, safety requirements, labeling. Perfumery and cosmetic products. General characteristics.

8. Commodity analysis of items for patient care, sanitation and hygiene of specialized food products, disinfectants, perfumes and cosmetics.

1. Classification of medical devices, patient care items

The assortment of pharmacies must necessarily include goods for sanitary and hygienic purposes and items for patient care, since in case of serious illnesses, after surgical interventions, for non-walking patients and in other cases, they are necessary to ensure human life. They belong to medical products, in the range of which are hygiene and dressings, medical clothing and more.

Medical devices are medical products made of glass, polymer, rubber, textile and other materials, reagent kits and control materials for them, other consumables and products, mostly single-use, that do not require maintenance during use (Order M3 of the Russian Federation No. 444 dated 12/13/2001 "On the validity period of registration certificates for medical products and medical equipment").

This group of products occupies about 20% of the total market of medical devices, which underlines its importance for the medical industry.

Order of the Ministry of Health and Medical Industry No. 161 dated June 9, 1995 regulates the assortment list of medical products, items for patient care, prevention, sanitation and hygiene, which should be in pharmacies.

Assortment list of medical products, items for patient care, prevention, sanitation and hygiene for pharmacies (Order No. 161 of the Ministry of Health and Medical Industry of the Russian Federation of 06/09/95)

- Hygienic rubber belts
- Bubbles for ice
- Respirators, medical masks
- Baby nipples
- Douches
- Means of protection (caps, condoms, intrauterine devices)
- Cups for taking medicines
- Bedpans
- Suspensors
- Medical thermometers
- Canes
- Medical tubes

- Stockings, half-stockings (knee socks) medical
- Medical syringes

In recent years, groups or series of products have appeared on the Russian pharmaceutical market, designed to solve certain problems of healthy or sick people.

2. Rubber products and patient care items

For various medical procedures and for patient care, sanitary and hygienic products made of rubber and latex are needed. They are waterproof and elastic. Types of rubber sanitary and hygienic products, depending on the material of manufacture, are shown in fig.

Latex products include:

Medical gloves: are divided into three groups, including:

1. surgical,
2. diagnostic (examination) non-sterile;
3. anatomical.

Surgical gloves are produced in anatomical shape for tight fitting of hands (10 numbers, length 270 mm); sterile and non-sterile; powdered inside or powder-free; thin, ultra-thin or extra strong (50% thicker than usual), which provides high resistance to punctures and mechanical damage; to protect against x-ray exposure, lead inclusions can be included in them; for use in obstetrics, gynecology, urology, gloves with an elongated cuff (length 387 mm) are produced; to enhance tactile sensitivity and certain surgical procedures, the surface of the gloves can be textured.

Diagnostic non-sterile gloves are available latex and latex-free (nitrile and vinyl), powdered and non-powdered inside; may be blue or green; with and without textured surface; resistant to chemicals, oils. Designed for use in dentistry, laboratories, diagnostics, nursing, endocrinology, gynecology, food blocks, etc.

Anatomical gloves are produced to protect the hands of medical personnel from contamination, mechanical and possible effects of harmful substances (for example, when working with cadaveric materials). The thickness of their walls is 0.5 mm.

The fingertips are designed to protect the fingers, they are produced in 3 numbers depending on the length (63, 70 and 77 mm) and half-perimeter (24, 26, 28 mm).

Nipples are differentiated into nursing nipples and pacifiers (attached to a plastic disc with a ring); nipple sizes for children aged 0 to 6, 6 to 12 and 12 to 24 months. For the manufacture of nipples, silicone rubber is used, indifferent to food products, chemically stable in relation to the saliva of the child. The nipples must withstand frequent boiling.

The group of rubber products includes:

Heating pads are rubber containers that, if local heating of the body is necessary, are filled with hot water, they are also used for washing and douching. The quality requirements for heating pads are established by GOST 3303-94, according to which two types of heating pads are produced:

A - for local warming of the body;

B - combined, used both for warming and for washing and douching, so they are equipped with a rubber hose (length 140 cm), three tips (for children, adults, uterine), an adapter plug and a clamp.

Heating pads come in 3 capacities: 1.2 and 3 liters (for example, type A-1 - type A heater for 1 liter, etc.). Warmers are made from colored rubber compounds.

Quality control is carried out for leakage: when immersed in water, the heater should not leak; also for strength and tightness.

Ice packs are designed for local cooling in various injuries, in gynecology. They are containers of various shapes with a wide mouth for filling with ice, closed with a plastic stopper.

Available in 3 sizes with a diameter of 15.20 and 25 cm. They hold 0.5-1.5 kg of ice. They release bubbles for the heart, different for men and women, for the ear, eye, throat.

Liner circles are ring-shaped bags that are inflated with air and closed with a valve. Designed for the care of bedridden patients in the treatment and prevention of bedsores. Available in three sizes: No. 1 9.5/30 cm; No. 2 - 13/38 cm; No. 3 - 14.5 / 45 cm. Quality assessment is carried out during tests for strength and tightness.

Douches are pear-shaped rubber cans with a soft or hard tip. Necessary for the care of the sick, as well as for healthy people in order to wash various channels and cavities. There are 2 types of syringes: A - with a soft tip (a single unit with a canister); B - with a hard tip (made of plastic). Different numbers are produced depending on the volume in ml (15, 30, 45, etc. up to 360). The volume of the syringe is determined by multiplying the number by 30 ml, for example, No. 2.5 has a volume of $2.5 \times 30 = 75$ ml.

Irrigation mug (Esmarch) is a wide-mouthed flat container connected to a rubber tube with a pipe. Designed for douching. Available in three sizes depending on the capacity of 1, 1.5 and 2 liters.

Bedpans are intended for the toilet of bedridden patients. They are backing circles of an oblong shape with a bottom.

Uterine rings are shaped hollow rings designed to prevent prolapse of the uterus. They are made of light-colored rubber, must be elastic, without cracks, bubbles, various protrusions on the surface. Available in 7 numbers depending on the diameter.

Medical lined oilcloth is a durable cotton fabric (coarse calico, calico), on one or both sides with rubber appliqué. Lining oilcloths based on polymers (from vinyl plastic) are produced. A variety of medical oilcloth is compress oilcloth, which is made from a lighter fabric coated on one side with rubber or polymer, and on the other with resinous anti-rotten impregnation.

Bandage type "Ideal" is designed for bandaging legs with varicose veins, made of knitted fabric with woven rubber threads, it is worn during the day, because it does not interfere with skin respiration.

For the same purposes, elastic stockings, stockings, tights of various sizes are produced.

Made from therapeutic compression stockings, the structure of the fabric helps to remove moisture to the outside and maintain a comfortable microclimate.

Types of goods: Mediven asset, Mediven plus, Mediventtravel (tread socks), Mediven forte, Medivenelegans (have an elegant design). The model range of the series has a very wide range of models, different colors, sizes. The same company produces a series of similar products, but for use in a hospital environment, incl. for compression treatment after surgical interventions on the veins of the lower extremities.

Tubes for various purposes are also made from rubber and synthetic materials, in particular for draining wounds, suctioning liquids, removing gases, blood transfusions and other purposes.

3. Предметы ухода за больными

Among the significant range of patient care items, the main products are:

Bandages are a belt or bandage for closing defects in the abdominal cavity or maintaining internal organs in a normal position. Hernial bandages are produced: inguinal one- or two-sided for adults, umbilical.

To support the fetus during pregnancy, prenatal bandages are recommended, and after childbirth, postpartum bandages are available in several sizes.

At present, compression bandages BKP-Unga "Super" and "Unga-rus", a compression corset-shirt, knee and elbow bandages, treatment and prophylactic belts are produced. Manufactured by Tonus (Russia)

Suspensions are supporting dressings for hanging organs, in particular for diseased male genital organs.

Wooden sliding crutches (axillary) are designed for movement and support in case of various diseases of the legs. Available for adults and children.

Walking sticks are used to create additional support when moving. Available in wood or aluminium, in various lengths. The canes have a plastic handle and rubber tips (crutches), which are available separately and in various diameters.

Eye pipettes are used to instill drugs into the eyes, they are a glass tube with a rubber cap. The diameter of the tube is from 5 to 7.5 mm, and the hole inside is 0.8-1.9 mm.

Currently, dropper bottles are produced for eye medicines, which greatly facilitates the process of instillation for the patient, as well as the maintenance of the medicine at home.

Medical jars are intended for medicinal purposes and are mostly used for colds and inflammatory diseases of the respiratory system. Available in different capacities - 45, 60, 75 and 90 ml.

Instep supports are elastic steel plates upholstered in leather, repeating the bend-arch of the plantar surface of the foot, used for flat feet. They are made in different sizes depending on the length of the foot.

HOLLOW RUBBER PRODUCTS PRODUCED BY MOLDING

Rubber heating pads are designed for local warming, washing and douching. According to GOST 3303-82, two types of heating pads are provided: A - for local warming of the body (1) and B - for washing, douching and local warming of the body (2). The body of the heater is the same for both types, however, type A heater has only a screw cap, and type B is equipped with a 1400 mm rubber hose, the end of which is fitted with a tee with a tap and a tip. The hot-water bottle is completed with three tips: for children, adults and uterine. Warmers are produced in three capacities - 1, 2 and 3 liters, with a loop for hanging in two versions, protruding (2) and hidden (1).

When checking quality, pay attention to the lack of leakage. The test is carried out by immersing the heating pad in water and squeezing it with your hand. In this case, the heating pad is filled with air and tightly closed with a cork. The strength of the walls and the tightness of the heating pad can be established as follows: it is filled to 3/4 of the volume with water and, screwing the cork tightly, place a board with a load of 25 kg on the heating pad for 3 hours. Under these conditions, there should be no leakage.

Rubber bubbles for ice (GOST 3302-95) are used for local cold treatment using ice for this purpose. Rubber bubbles (Fig. 4, 3) are reservoirs of various shapes with a wide neck (diameter 50-60 mm). "The neck is closed with a plastic stopper with a screw closure having a voluminous rubber washer as a sealing gasket. Rubber bubbles come in three sizes: 150, 200 and 250 mm in diameter. They hold from 0.5 to 1.5 kg of ice. In addition, special ice bubbles are released on the heart area for men (a) and women (b), bubbles for the ear (c), eyes (d) and throat (e), equipped with rubber loops for attaching to body. Guaranteed shelf life of bubbles 3.5 years.

The tightness of rubber bubbles is checked as follows: the bubble is filled with air, the cork is screwed tightly, immersed in water and slightly squeezed. For the purpose of verification, it is recommended that the water filling the bladder be tinted with eosin or brilliant green. After carefully closing and wiping the bubble dry, place it for 2 hours with a cork down on a dry sheet of clean filter paper. Leakage is judged by traces of paint.

Bubbles are packed 10 pieces in a box. Each bubble must be accompanied by instructions for use and storage. The warranty period of operation in medical institutions is 1.5 years, with individual use - 3 years.

Lining circles serve to protect against the formation of bedsores, as well as in their treatment in long-term patients. Lining circles (Fig. 4, 4) are air-inflated annular-shaped bags of the type of autocameras, equipped with a bicycle sample valve firmly fixed on the outside. Through the valve with the help of a pump, the circle is moderately filled with air. Circles are made (by manual

gluing) in three sizes (No. 1, No. 2 and No. 3), distinguished by the size of the inner and outer diameters: No. 1 - 95/300 mm, No. 2 - 130/380 mm and No. 3 - 145 /450 mm. The test for strength and tightness is carried out using a board with a load of 90 kg placed for 1 hour on an inflated circle. By lowering its height, an air leak is judged. The tightness is judged by testing by immersing the inflated circle in water while lightly squeezing it with your hand. Warranty period of storage of lining circles is 1 year.

Rubber bedpans are used to serve seriously ill patients at home and in hospitals. Vessels differ from rubber circles in the presence of a bottom and have an oblong shape. Vessels are produced in three sizes depending on the length and width.

Douches are used for washing various channels and cavities (including wounds) in children's practice - for cleansing and other enemas, used in laboratory work. Large syringes are more often used for enemas, medium ones for washing the ears, small ones for laboratory work. Syringes are a pear-shaped rubber balloon with sufficiently elastic walls of various capacities with a soft (a) or hard (b) ebonite or plastic tip. Soft-tip syringes (type A) are produced with a capacity of: 15, 30, 45, 60, 75, 90, 120, 180 and 270 ml. On the bottom of the balloon, they have respectively the designations - 1/2; one; 1 1/2; 2; 2 1/2; 3; 4; 6 and 9. Each syringe number corresponds to 30 ml capacity. Hard tip syringes (type B) are numbered 1; 1 1/2; 2; 2 1/2; 3; 4; five; 6; nine; 12, which correspond to certain capacities. The warranty period of storage of syringes is 1 year.

Rubber cylinders of syringes must have sufficient elasticity, which is commonly called the activity of syringes. It is expressed as the number of seconds it takes to fill the syringes with water. GOST establishes the proper activity of syringes depending on their capacity after exposure to a 1% solution of phenol, denatured alcohol or by repeated boiling. water. So, for syringe No. 1 type A act

TUBE ELASTIC PRODUCTS

Elastic tubular products are widely used in medicine (and not only as items of patient care).

Tubes made of rubber and synthetic materials are used as drainage in the treatment of wounds, for blood transfusion, the introduction and suction of fluids from the body, and in laboratory practice. Medical rubber tubes are produced in accordance with GOST 3399-76 in bundles and packed in rubberized fabric bags or cardboard boxes with a length of at least 1.5 m.

Depending on the purpose, the tubes are produced - more than 50 sizes.

ELASTIC PRODUCTS FOR ANESTHESIA AND ARTIFICIAL RESPIRATION

Air ducts are designed to ensure free passage of air during artificial respiration with or without the apparatus. Air ducts produce two types - nasal and oral.

Elastic tubular rubber products

Tubes made of rubber and synthetic materials are used as drainage in the treatment of wounds, for blood transfusion, the introduction and suction of fluids from the body, in laboratory practice. Depending on the purpose of the tube, more than 50 sizes are produced.

Catheters are a fairly large group of products. Catheters are designed either to remove content from various body cavities, or to introduce solutions and nutrients necessary for the body. There are the following types of catheters:

Probes are intended for introduction into the cavity and taking content from them (samples for research).

Classification of rubber gloves

1. According to the materials from which the gloves are made

latex - the most common type of medical gloves, which are made from natural rubber latex. They provide a high degree of protection against the penetration of viruses such as HIV, hepatitis B and C, as well as other diseases transmitted through the blood. Natural latex gloves also have high strength and elasticity, provide comfortable use, a snug fit and tactile qualities.

Recommended for use in medical institutions for daily examination of patients, laboratory tests, etc. Among the disadvantages are allergic reactions to latex.

nitrile (perfectly withstand the effects of aldehydes, alcohols, phenols and acids, which allows the use of nitrile gloves in laboratories, when working with aggressive environments, do not cause allergic reactions, but in some cases can cause contact dermatitis with too long work. Due to low elasticity and extensibility, nitrile gloves are practically unsuitable in surgery);

polyisoprene and polychloroprene. There is no justified need to use polychloroprene and neoprene gloves, as they are similar in chemical resistance to nitrile gloves. At the same time, the use of such gloves during surgical operations allows for a high level of protection for all members of the surgical team;

vinyl (they have one important drawback: easy permeability to any proteins (including blood proteins) and microorganisms, which does not allow them to be used even for a short-term examination of patients. Vinyl gloves are widely used to maintain an adequate level of sanitation. The main difference from latex gloves is hypoallergenic, since they do not contain natural latex, etc.)

2. Behind the form

universal (the same shape for the right and left hand);

anatomical (different shape for the right and left hand).

3. Surface treatment

· smooth;

textured (for a more comfortable grip of small medical instruments);

microshort.

4. For the presence or absence of substances that facilitate putting on gloves

powdered surface;

powder-free surface

use of special silicone lubricants.

5. By frequency of use

single use;

Reusable application.

6. Presence or absence of a roller

gloves with a roller (the roller is a structural element of the glove. With it, the glove is fixed on the wrist. In gloves, it must be twisted inward. If it is twisted towards the outside, then there is a possibility of accumulation of elements with an infectious hazard between the roller and the outer surface)

gloves without a roller (in the absence of a roller, a reinforced or reinforced cuff that fits tightly around the wrist should be an obligatory component of the glove).

7. By the presence of preliminary sterilization

· sterile;

non-sterile.

8. By purpose and scope

diagnostic (examination);

· surgical;

Anatomical

dental.

Gloves should fit tightly around the hand, in no case should they slip off. Factories produce gloves of various numbers depending on the width of the palm and the size in the wrist area:

• XS - corresponds to size 4-5;

• S - small, corresponds to size 6-7;

- M - medium, corresponds to size 7-8;
- L - large, corresponds to size 8-9.

The most common (up to 70%) in medical practice are diagnostic (examination) rubber gloves. The total length of the product is 24 cm. They are suitable for research manipulations, medical procedures, minor surgical procedures. Available in sterile and non-sterile versions.

Surgical gloves are used for aseptic operations, as well as for manual examination of infected human organs and tissues. Gloves should be primarily waterproof and at the same time not interfere with the hands and not disturb the tactile sensitivity of the fingers.

Surgical gloves differ from diagnostic ones in an elongated cuff (the total length of the product reaches 28 cm), anatomical gloves in shape (subdivided into "left" and "right"), higher tactile sensitivity, and the presence of textured areas for a firm grip on instruments. Large sizes of gloves No. 8-10 are considered male, small - female.

Anatomical gloves are used for pathoanatomical autopsies and other anatomical work in order to protect the doctor's hands. In this regard, they are subject to the requirements of increased strength and impermeability. They differ from surgical ones in greater wall thickness (about 0.5 mm) and are produced in three numbers: No. 6-9.

Dental gloves - a kind of diagnostic. They also have a textured surface, and special fragrances are used during their production to mask the smell of rubber.

The warranty period for all rubber gloves is determined by the manufacturer. Most often it is from 1 to 5 years.

The sterility of gloves is ensured by sterilization, that is, complete release from all types of microorganisms, including bacteria and their spores, fungi, as well as protein prions. Sterilization can be carried out by thermal, chemical, radiation, filtration methods; in industrial conditions, surgical gloves are sterilized by chemical (ethylene oxide gas sterilization) or radiation (gamma radiation) methods.

As noted earlier, rubber gloves are effective in preventing hand contamination and reducing the transmission of potentially pathogenic microorganisms.

Therefore, it is the ability to apply the correct technique for putting on and taking off rubber gloves that will help prevent contamination. These rules are given in the information letter "Use of gloves" of the World Health Organization.

Medical latex fingertip - designed to protect and isolate fingers. Fingertips can be used at least three times. The edges of the fingertip are wrapped in a whisk.

Specifications:

- medical fingertip is made of natural latex or latex-rubber composition permitted for use in accordance with the current regulatory documentation
- safe in operation for human health;
- resistant to repeated disinfection, pre-sterilization cleaning and sterilization.

Three numbers are made, 63, 70 and 77 mm long and semi-perimeter 24, 26 and 28 mm in size; wall thickness 0.2-0.3 mm. Packed in sealed plastic bags of 10 pieces. The warranty period depends on the manufacturer.

Rubber caps in medical pipettes are intended for dressing on glass pipettes. The inner diameter is 5 mm and the length is 40-50 mm, with a wall thickness of 1.5-2 mm. Caps should not stick to the inner surface.

Rubber baby nipples. Depending on the purpose, nipples are made of two types: 1 - milk nipples intended for feeding children and 2 - pacifiers - pacifiers intended for calming children)

Technical and sanitary requirements:

The following requirements apply to rubber medical products:

- stability of products during operation;
- physical and mechanical properties (strength, elasticity, resilience);
- tightness (only for hollow rubber products);
- resistance to repeated disinfection or sterilization;

completeness;
absence of foreign inclusions;
no signs of aging (cracks, stickiness, discoloration).

Disinfection and sterilization of rubber products

Sterilization of rubber products such as heating pads, catheters, probes, tips in medical institutions is carried out in steam sterilizers. Sterilization takes place in an autoclave under the action of air vapor supplied under pressure.

Disinfection is most often carried out by immersion in a 1.0% chloramine solution, 3.0% hydrogen peroxide solution or 3.0% hydrogen peroxide solution with the addition of 0.5% detergent solution, etc.

Marking of rubber products

Given the individuality of each rubber medical product, their marking is carried out in accordance with the current regulatory documentation (GOST, GOST R, TU, etc.) for a particular product, that is, there is no single marking for them. Therefore, we considered an example of marking a rubber heating pad type A, which is carried out by an engraving print on a mold or marking paint or a label, or a combination of these methods.

Marking includes:

- trademark of the manufacturer;
- product name;
- type of product;
- capacity, dimensions or item number;
- date of manufacture (quarter (in Roman numerals), year - the last two digits (in Arabic numerals))

- technical control stamp or packer's number;
- designation of the standard.

Each box (box) in which the products are packed must be labeled with:

- name of the manufacturer and its trademark;
- symbol of the product;
- date of manufacture (quarter (in Roman numerals), year - last two digits (in Arabic numerals))

- quantity of products.

Transport marking includes the application of the following additional designations:

- product name;
- quantity of products.

Labeling of heaters intended for export must comply with the terms of the contract between the manufacturer and the foreign economic organization or the terms of the contract.

Packaging of rubber products

Consumer packaging for rubber products are plastic bags, boxes or cardboard packs. Corrugated cardboard boxes are most often used as transport packaging.

No more than 10 pieces are placed in each box. products, in boxes - no more than 50 pcs. Transported by all types of covered transport at temperatures from -50 to + 50 ° C. During transportation, the products should not be exposed to oils, solvents, acids, alkalis and other substances that destroy rubber.

Features and rules for the storage of rubber products.

For the safety of rubber products in storage rooms, it is necessary to create the following conditions:

- protection from light, especially direct sunlight, high (over 20°C) and low (below 0°C) air temperatures; flowing air (drafts, mechanical ventilation); mechanical damage (compression, bending, twisting, pulling)

- to prevent drying, deformation and loss of their elasticity, relative humidity of at least 65%;

- isolation from the action of substances (iodine, chloroform, ammonium chloride, lysol, formalin, acids, organic solvents, alkalis, chloramine B, etc.)

- storage conditions away from heating devices (not less than 1 m).

The storage room for rubber products should not be located on the sunny side, preferably in the basement dark or dark rooms.

For the storage of rubber products, the premises are equipped with cabinets, drawers, shelves, racks, racks and other necessary equipment, taking into account free access. Medical rubber products should not be stacked in multiple layers, as products in the lower layers will shrink and stick together. Storage cabinets should have tightly closed doors and a smooth surface inside. Cabinets intended for storing rubber products in a supine position (bougie, catheters, ice packs, gloves) are recommended to be equipped with drawers so that objects can be placed at full length, freely, avoiding bending, flattening, twisting. For storage of products in a suspended state (harnesses, probes, irrigator mugs) are equipped with hangers located under the cabinet cover.

The room must be protected from exposure to sunlight, so the windows are curtained or painted over. Lighting is only artificial, electric.

Particular attention should be paid to the storage of certain types of rubber products that require special conditions:

- lining circles, rubber warmers, ice packs should be stored with stoppers installed at the ends and slightly inflated;

- Removable rubber parts of appliances should be kept in a separate

PATIENT CARE ITEMS

Medical oilcloths

Oilcloth

Bandage rubber

Elastic stockings

Sponges rubber

Bandages are used for external hernias to prevent protrusion and infringement of internal organs and to strengthen the abdominal wall.

Wooden sliding crutches (axillary) are used for movement and support in various diseases of the legs. Canes for invalids are designed to create additional support when moving. They are made of wood or aluminum pipe, and the handle is made of plastic; have the same rubber tip as crutches. Painted with light enamel paint. They produce canes of various lengths: from 75 to 90 mm. Rubber end caps are also produced separately with an internal cavity diameter of 16, 19, 22, 25, 28, 30 and 32 mm.

Instep supports are used for flat feet.

Glass urinals

The bedpan is used in hospital and home conditions for servicing bedridden patients.

Spectacle optics

Ophthalmology is a field of medicine that studies the physiological and pathological processes of the organ of vision, as well as the prevention and treatment of eye diseases.

Devices for the control of means of optical correction of vision - devices with the help of which the main indicators of spectacles are checked

One of the main functions of the eye is visual acuity, or the ability to recognize objects of minimal size at a maximum distance. It is believed that a person who can count the fingers on his hand from a distance of 50 m sees well. The angle between the retina and the sides of the finger has a width of 1 minute. This ability - to see at an angle of view equal to 1 minute - is called a unit (1.0), or, as they sometimes say very simply, one hundred percent vision.

An important, but not the only condition for good vision is the need for the rays coming from objects to connect exactly on the retina. This is possible if the length of the eye and the strength of its

optics - refraction - correspond. The proportionality of the length and optics of the eye is called emmetropia, disproportion - ametropia.

If the eye is small or the optics are weak, parallel rays will converge only behind the retina, and the image on it will be blurry. The closer to such an eye the object observed by him, the rays from it converge farther from the retina and the worse a person with weak refraction sees. Since he sees distant objects better than close ones, he is called far-sighted.

In some, the length of the eye is too long or the power of its refractive optics is too strong, so parallel rays from distant objects will converge in the eye before they reach the retina. Only divergent rays from nearby objects can gather on the retina. Therefore, such a refraction is called myopia - myopia. To compensate for vision with myopia, to part the rays and make refraction weaker, "minus" glasses placed in front of the eye can. With farsightedness on the retina, rays that had a converging direction even before they hit the eye could connect. But in nature there are no such rays.

Gathering rays can be created artificially - by placing a convex "plus" glass on the eye. The figure shows the change in the path of the rays when the glasses are in front of the eyes with different types of disproportionate refraction. The eye itself can to some extent change its refractive power when viewing objects at different distances. This is possible due to the fact that the curvature changes, and hence the refractive power of the lens.

Such adaptation (focusing) of the eye to vision at different distances is called accommodation.