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ABOUT IMPROVEMENT OF THE UNION OF THE ORTHOPEDIST AND PRODUCERS OF CORRECTIVE MEANS FOR REDUCTION OF PATHOLOGICAL DEVIATIONS OF FEET AT CHILDREN (MESSAGE 3)

Abstract: *in the article, the authors have developed recommendations for the orthopedist and manufacturers of orthopedic shoes on its correct selection, taking into account pathological abnormalities, to ensure the formation of a healthy foot for the child, excluding the formation of pathological abnormalities. At the same time, the authors substantiate their concern about the reduction of social protection of families in Russia, whose children have pathological abnormalities, to provide them with free service from an orthopedic doctor in regional centers with mandatory payment by social bodies of municipal, regional and Federal branches of government of the costs of manufacturing medical, preventive shoes and corrective products that create comfortable conditions for the child's foot.*

Key words: *valgus, varus, clubfoot, hard side, pronator, oblique, cork, arch layout, beveled heel, lacing, hard heel, hard toe, special soft, hard and metal corrective parts, range of shoes, pathological abnormalities, anthropometry, demand, implementation, competitiveness, demand, financial stability, plantography, rengenography, plaster casts, prosthetics, rehabilitation.*

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Introduction

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the beginning (the first part)

Solve the problem of preserving and strengthening health can not only using the medicine are important external environment and way of life. It should be understood that the way of life - it is not only the presence or absence of bad habits. Lifestyle is a social category and includes welfare, culture, education, medicine, as well as the quality of

consumed products. So, for products that can affect children's health concerns and shoes. A significant prevalence of foot deformities of children, such as flat feet, makes the problem of mass production of shoes with preventive properties. Shoes with prophylactic properties of a certain segment of the consumer market of Child and Adolescent shoes. It is distinguished by the presence of design solutions, providing its maximum comfort in wear, the presence of special parts (ins anatomical insoles, polustelki, calculations), a rational evidence-based internal form

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of footwear and application of high-tech materials in the manufacture of shoes, their rigorous selection of physical - mechanical and hygienic parameters. On preventive footwear experimenting with new designs and materials to ensure maximum comfort for imposed the, and the creation of necessary conditions for the prevention of disease and foot deformities.

What are prophylactic and orthopedic children's shoes?

First of all, what is called the orthopedic shoes: Orthopedic footwear, according to GOST R 57761-2017 - a shoe, the design of which was developed taking into account abnormalities in the foot, lower leg or thigh. Based on this definition, think for yourself: Do I need "orthopedic" shoes a healthy baby? Should the right children's shoes to be an orthopedic? In our understanding, no. But in this matter, such confusion is created, often in orthopedic salons and pharmacies sell the right children's shoes, which is called orthopedic. And in fact it is preventive shoes, or shoes made just for everyday wear in accordance with GOST 26165-2003. Prophylactic - a shoe, the design of which was developed in view of preventing the formation of pathological abnormalities in the child's foot.

This definition gives just the most famous Albrecht Institute in Saint - Petersburg. Thus, the "orthopedic" shoes for kids today is divided according to GOST R 57761-2017 on prevention and therapeutic children's shoes.

Preventive shoes - this is the right baby shoes recommended for healthy children who stop looks like she put on age. Consider its features.

What materials should be manufactured children's shoes? Made of soft, natural, ventilated. Natural materials and should be the top, and the "insides" of the shoe to the foot of the child did not sweat and there were no irritations baby delicate skin of the foot.

More precise characterization of materials
Preventive shoes.

What should be the sole? She must be:

1. Flexible so as not to disturb the operation of the foot and lower leg muscles. Moreover, the sole should bend not anywhere, that is, in place of the joints where the shank goes into fingers.
2. Not moving to reduce the risk of falls.
3. With a roll in front of, that is, its toe should be slightly raised above the ground. It is necessary to correct gait (Figure 1) formed in the child.



Fig. 1 - Appearance of Preventive children's shoes

What should be the toe of the right children's shoes?

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It should be broad. No narrowed socks in children's shoes should not be, fingers to the foot of the child to feel free.

Should there be a heel?

Yes, a little heel should be 5-10 mm. Firstly, it prevents the child fall back, that often happens in

children. Second, it increases the load on the muscles of the foot and helps her workout muscular system.

Heel shape must be such as shown in Figure 2:



Figure 2. Heel shape for preventive children's shoes

This is Thomas heel, he lengthened on the inside to keep the middle part of the foot and prevent blockage inside it.

What should be the backdrop?

It should be closed and rigid, to the child's heel is properly locked and will not overwhelm (Figure 1).

What should be the clasp?

They need to be regulated, it is good to fix the leg of the child.

The preferred Velcro fastener shown in Figure 3.



Figure 3 - view of the children's prophylactic footwear with Velcro clasps

Do I need arch support in children's shoes?

Instep - a small rise on the inner side of the insole, which is located under the longitudinal arch of

the foot and "supiniruet," that is deploying the foot outward (Figure 4).

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Figure 4 - Corrective detail - the instep for prophylactic and orthopedic children's shoes

With regard to this element the most disagreement among doctors - orthopedic surgeons, the prevailing view that it is not needed in preventive shoe. Why?

- At first, it must be positioned precisely at a certain place of the foot. But often buy baby shoes "for growth", and the instep is not where it should be. This can only harm a developing child's foot.

- Secondly, by maintaining the place where it should form a set, how it can be generated? In our opinion, the instep only hinders training of their own child's foot muscles.

In addition, the insoles are different: small, soft, or, on the contrary, hard, high. The latter must be made individually for a specific step. Low soft insoles are recommended only in the sports children's shoes. At high physical activity is important to support the longitudinal arch. But if sports shoes is not used for its intended purpose, and to "force" in it, the arch support is not needed. Shoes with arch support properly be called "preventive and curative" and, in our opinion, it should recommend a doctor - orthopedist at the initial stages of a child's flat feet.

Thus, the signs of the right children's shoes, designed for a healthy baby are:

1. Natural materials.
2. Flexible, non-slip, with a roll sole.
3. Wide toe part.
4. 5-10 mm heel
5. Hard backdrop.
6. Adjustable buckles.

7. Lack of arch support. At least in the pre-school shoes.

But the correct conclusion that the forced correction arches of the foot in children 6-7 years old violates the process of formation of the child's foot, and if the child has signs of mild flat foot, the doctor - prescribe orthopedic shoe insole in prevention with the laying out of the longitudinal arch. This will be the best solution.

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Figure 5 - The appearance of the summer children's orthopedic (medical) Shoe

Therapeutic shoes for children, which can be seen in orthopedic salons and pharmacies, and is divided into antivarusnyuyu antivalgusnyuyu. Some producers still allocate a stabilizing shoe that is applied with a slight varus, and with a slight valgus. This shoe puts the foot in the correct position and stabilize it (Figure 5).

As you can guess, antivarusnaya shoes used in varus foot deformity, that is when the child goes to the outer arches - "Clumsy" and antivalgusnaya - when he walks on the interior arches, ie, when the foot "fall down" inside. Moreover, these deviations are beyond the physiological characteristics of the child's foot. Antivarusnaya stop looking as if the left leg confused right. In more complex cases, orthopedic shoes are produced individually for a particular child, taking into account the pathological changes of his foot.

Therapeutic shoes is done on a special orthopedic shoe -GOST P 53800-2010. Shoe last - a wooden or plastic molding for manufacturing of shoes, designed to meet the specific pathology. For various pathology uses its own block. These shoes, as opposed to preventive, higher, to be fixed in the correct position, not only to stop, but the ankle. Along with the tough backdrop, it has a tough ankle boots, that is the hard side panels, which have a certain length. Therapeutic footwear heel has Thomas: antivalgusnaya shoes with an elongated inner edge, antivarusnaya - with an elongated outer edge (Figure 6).

There should be no arch support in medical footwear. If necessary, the doctor - orthopedist appoint a lord taking into account the particular pathology of the foot may be an individual.

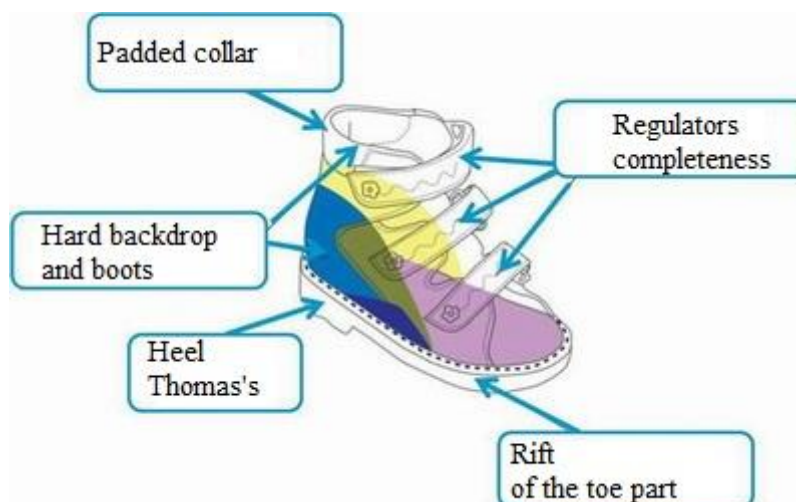


Figure 6 - DATA Specific children's orthopedic shoes

Dear adults, remember that foot baby - very "grateful" materials for correction. It is soft and pliable. The main thing is not to miss. Foot pathology in children can be corrected up to 10 years of age. So

stop you - the parents - to hang around at the computer, and pay more attention to their child.

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Characteristics of rational design of the following preventive footwear

Increased comfort requirements infant shoes are preventive plurality anthropometric, hygienic and psychophysiological properties, resulting in, provided that the normal functioning of the foot. Using shoes, not satisfying the requirements of hygiene, as well as having even a slight deviation in a ratio of shape and dimensions vnutriobuvnogo space with the shape and dimensions of the foot may lead to deviations from the normal anatomic structure and functioning of the foot, and as a consequence, adversely affect the overall health child.

Currently, there is a significant prevalence of foot deformities and diseases of children. The occurrence of these distortions, the most frequent initial degree of flatfoot, and increased sweating, footwear plays an important role.

Comfortable shoe to be determined by its ability to maintain vnutriobuvnom space required humidity and temperature, which in turn depend on the selected materials for the manufacture of shoes and its structure. Moisture is marked with a foot surface, it is removed from the space vnutriobuvnogo resulting moisture exchange processes due to sorption capacity and vapor permeable materials and so-called ventilation effect when moisture is removed from the space between the foot and footwear.

In the closed ventilation shoe as a result of the effect of a slight amount of moisture is removed. At the same time a closed shoe uppers are widely used artificial leather (IR), rubber and PVC with low water vapor permeability and hygroscopicity. In such shoes vnutriobuvnom space accumulates a large amount of moisture, which causes discomfort, and the appearance of skin diseases. When used for a closed shoe upper materials tight removal of moisture from the foot occurs mainly by absorption of internal components - liner and the supplementary insole. Thus most of the moisture is concentrated in the main and supplementary insole, so the material of these parts must be moisture capacity. Insole materials are characterized by high density, high strength after soaking in water and low friction in wet condition. In addition, insole materials should be flexible, porous and vapor - permeable and, have low thermal conductivity to prevent overheating of the foot in the heat and cooling without resizing a change of moisture content does not buckle upon moistening and drying, have elasticity. Removable insoles improves the thermal insulation properties shoe bottom, cushioning capacity increases, lengthening the period of wear and facilitating walking. Removable insoles should be flexible, soft, resilient, have a low density.

The company Ompipel (Italy) created the Micro-Air material for loose insoles. This flexible composite material based on polyurethane having an open cell structure, air-permeable and water vapor. Thanks to

the created pump effect while walking, it creates a pleasant climate in the space vnutriobuvnom. Its advantages can also be attributed good cushioning properties, the possibility of application in all types of shoes, low pressure deformation at multiple static and dynamic loads. Micro-Air can be laminated and, if necessary, treated with fungicides and activated carbon.

The company has developed a composition Emsold Carbosan for details of the foam. It includes activated carbon having a deodorizing action, ie. K. Absorbs substances secreted by the foot. The resulting foamed part (removable insoles, box stack) have good damping properties, kill bacteria and fungi and has a structure with high hygienic properties. Another promising direction is to manufacture materials for supplementary insoles based on flax fibers. Use of textile fabrics containing synthetic materials in technology because of the unique properties of flax - high strength, water absorption, anti-bacterial, ability to reduce static electricity - create opportunities for making artificial environmentally friendly materials with high complex consumer properties intended for the production of a wide range of children's shoes.

As a material for the manufacture of loose parts prophylactic shoes for different parts of the foot it is widely used silicone, as non-slip feet of supplementary insole. Silicone - elastic material, stop on it like a spring, causing the muscles and tendons of the legs are relaxed, blood circulation improves, walking becomes more comfortable and less tired legs. The skin-contacting side of the insole, as a rule, do antibacterial, absorbing moisture and odors, which also adds to the comfort during prolonged walking. In addition, the antibacterial coating allows the foot is easier to penetrate the shoes. Silicone - a material that is almost never causes allergic reactions and prevents the growth and development of various types of fungi and bacteria. Doctors recommend silicone insoles for prevention and treatment of flatfoot syndrome initial degree of diabetic foot, psoriasis, dermatitis, eczema, rheumatoid arthritis, heel spur, in rehabilitation after injuries, cracks and dry skin of the foot. Recently, during the drying of shoes are widely used silica gels.

Empirically it found that in a domestic environment drying shoes via silica gel is much faster and better (absorbed bolshey amount of moisture per unit time). Regeneration (dehydration) silica gels is 2 times faster, at a lower temperature than the drying zeolites. Silica gel is an amorphous form of silica, artificially produced in the form of solid granules uneven (externally resembling crystals), or a solid flat beads. The porous structure of interconnected voids creates an extensive surface area (up to 800 square meters per gram). The silica gel produced in industrial scale and is simple to use, it is capable of adsorbing a wide range of substances. It is most commonly used for the absorption of water vapor, i.e. it is capable of retaining molecules (eg., water) on its inner surface,

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so it is often called "dryer". Pore volume silica often exceed 0.2 ml / g, and the inner surface is greater than 400 square meters / gram. Pore radius range from 1 nanometer to several hundred nanometers. Silica gels are distinguished: in the form of grains (granular or lumpy); grain size (large and small); long (large pore and small pore) in size. According to GOST 3956-76 classify types of silica chetyrohbukvennym designation: 1st letter characterizes the grain size (R - large, F - fine, A - activated, W - leads charge); 2nd letter is always On (silica gel); Third letter of the pore size (K - a coarse, M - fine pore); 4th letter of the shape of the particles (D - granulated, K - lumpy).

Prophylactic properties of children's shoes depend essentially on the brace-supporting component, characterized by the distribution of local overloads on the plantar and dorsum of the foot and thereby provides the physiologically normal operation of the muscles and ligaments of the foot. Spacer - vpornuyu comfortable shoes can be increased by a supplementary anatomically contoured insole. Thus, functional disturbances disappear in a physiologically normal deformation of the foot and improve its Musculoskeletal, Suspension and jogging function.

Ins preventive device can increase the support surface and the contact area of the shoe with the foot, whereby the surface pressure is reduced and, accordingly, reduced leg fatigue while walking, which in turn ensures the quality of the shoe. Removable, prophylactic insole with anatomically the averaged profile for the foot bed, made of hygienic material with antimicrobial treatment can solve problemukomfortnosti shoe. Averaged streamlined profile supplementary preventive insole is an important factor in the creation of comfortable shoes for any purpose without imposed the clinical pathology in the anatomy of the foot. It is in this area and conducted research to develop new designs children's preventive loose insoles. Known construction supplementary insole for children's prophylactic footwear comprising an upper, intermediate and lower layers, the upper layer is made of leather, the intermediate layer of priformovyvayuschegosya in socks foamed thermoplastic material, and a lower frame layer of dense thermoplastic material, the intermediate layer with a recess in the heel portion under the tubercle of the calcaneus in 0,18D section, where a - the length of the foot, and the computation of uniform internal and external arches in part with gelenochnoy naivys s point in calcaneal - cuboid joint sectional 0.36 D. The top layer of the insole in the forefoot portion applied dimensional scale markings and a line color zones defining shoe size matching the length of the foot. In another design supplementary insole, consisting of a soft elastic lower layer, the upper layer of flexible, volumetric fixed spikes in the lower layer and on the surface of the insole groups at small distances from

each other, are intended for reflex-therapeutic massaging the foot of the child.

As a method of collecting information authors used questionnaires and interviews. Processing of survey results performed by methods of mathematical statistics.

When analyzing the number of prophylactic shoes in the wardrobe of the child plays a leading role age. For a clearer display, the results are presented as a percentage. Poll Results vast majority of children aged from 1 to 7 letpokazali that they have in their wardrobe at 1 and 2 pairs of prophylactic footwear also increased the percentage of children who are 4 and a pair of winter leather shoes.

According to the study found that in all age groups, children are mainly two pairs of leather shoes. High enough percentage of the presence of three or more pairs of shoes in the two older groups. The majority of respondents (60%) bought shoes on the market. From this we can conclude that the enterprises engaged in production of leather products, you need to make a shoe that would be completely on demand.

To the question "What is the property of prophylactic footwear in your opinion the most important?" The majority of respondents pay attention to durability and comfort. But the material from which made this shoes and hygienic properties of footwear do not pay enough attention. Children preventive footwear should be substantially free form, bright colors with various ornaments. It must be remembered that in this shoe the child has to be in the main street, so it should be hygroscopic.

Consider the answers to the question: "What are the challenges you face when selecting purchase prophylactic shoes?". As the answers were offered the following options: high price, bad appearance, excessive rigidity, it is inconvenient to put on the leg of the child, are not satisfied with the workmanship is not satisfied with the quality of materials. Parents of children at 3-4 years especially unhappy excessive rigidity of the heel of the shoe. Parents are the first children's age group noted the importance of when buying shoes quality of its manufacturing and ease of dressing on the leg of the child. For children of the third age group of parents pointed to the discrepancy between price and quality children's shoes, on its excessive rigidity and a high price.

Analyzing the data, we can confidently say that the most popular among parents and children enjoy the trademarks of leading Russian companies and Savienok Kotofey, despite the fact that there are local and regional producers of Preventive children's shoes.

Flat feet in children

Flat - foot deformity is to reduce its vaults.

Flat - it's not just a cosmetic defect. It is often accompanied by pain in the feet, legs, fatigue when walking, difficulty in running, jumping, deterioration

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of motor coordination, overloading of the joints of the lower extremities, the earlier appearance of pain syndromes osteohrondroza.

Flatfoot causes are: congenital abnormality (11.5% of all congenital defects of the foot), rickets, nervous system disease (paralysis, paresis of lower limbs, general muscular hypotension, and other), trauma stop (fractures of bones of the foot, ankle, wound with nerve damage, tendons, muscles) and inadequate static load. As a rule, there are several reasons for the complex. Most operate such more or less obvious factors as rickets, general muscular hypotonia, inadequate static load. The reason for the latter lies usually not in violation of the motor mode, and wearing shoes irrational child in violation of muscle tone, increased flexibility for bags and ligaments.

types of flatfoot

The following types of flatfoot:

- longitudinal;
- cross;
- combined (longitudinal poperenoe).

The degree of longitudinal flat

I degree: set angle $131^\circ - 140^\circ$, the height of the arch 35-25mm. Deformations of the bones of the foot there.

II degree: set angle $141^\circ - 155^\circ$, the height of the arch 24-17mm. Astragalus shortened cervix it is not highlighted. There may be conditions in arthrosis deformans talo-navicular junction or calcification ligamentous apparatus on the dorsum of the foot.

III degree: set angle 156° and above, the arch height of less than 17mm. A small protrusion on the plantar surface of the heel bone becomes massive. Is

noted and flattening and transverse arch, finger tapping contracture 1, proniruetsya foot, the heel is deflected outwards

Degree of cross flatfoot

I stepem: angle between 1 and 2 metatarsals $10^\circ - 12^\circ$, the angle of deflection fingers $15^\circ - 20^\circ$.

II degree: angle between 1 and 2 metatarsals $13^\circ - 15^\circ$, the angle of deflection fingers $21^\circ - 30^\circ$.

III degree: angle between 1 and 2 metatarsals $16^\circ - 20^\circ$, the angle of deflection fingers $31^\circ - 40^\circ$.

IV degree: angle between 1 and 2 metatarsals more than 20° , the deflection angle 1 bolshe finger 40° .

diagnosis of flatfoot

Children with flat feet, can express complaints leg fatigue, pain in the feet, legs while running, long walks and by the end of the day. Perhaps the appearance of headaches after the motor load as a consequence of reducing the spring stop function. At the feet of the localized pain, usually in the area of the arch, at the inner edge of the heel, in astragalocalcanean-scapoid articulation, under the ankles. The legs are localized pain in the calf or the tibialis anterior muscle. The height of the inner and outer arches of the foot is lowered, the foot is elongated and expanded in the middle and front sections. A vague navicular can through the skin on the medial side of the foot. Spanking gait characteristic of dilution of socks in hand, while standing desire to put the foot on the outer edge, uneven wear shoes: faster tread down the inner part (Figure 8 - 11,15,16).

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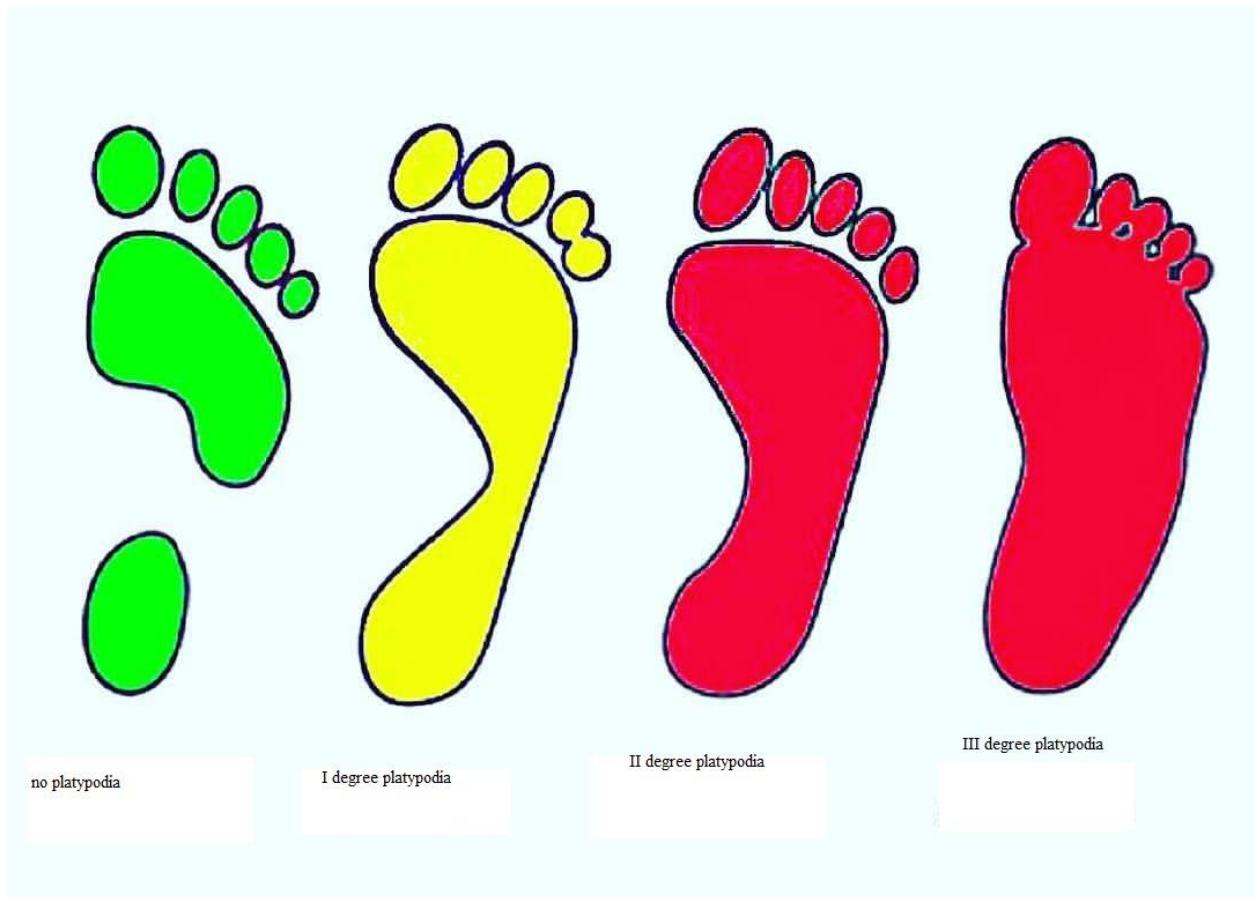


Figure 8-characteristic number of degrees of flat feet

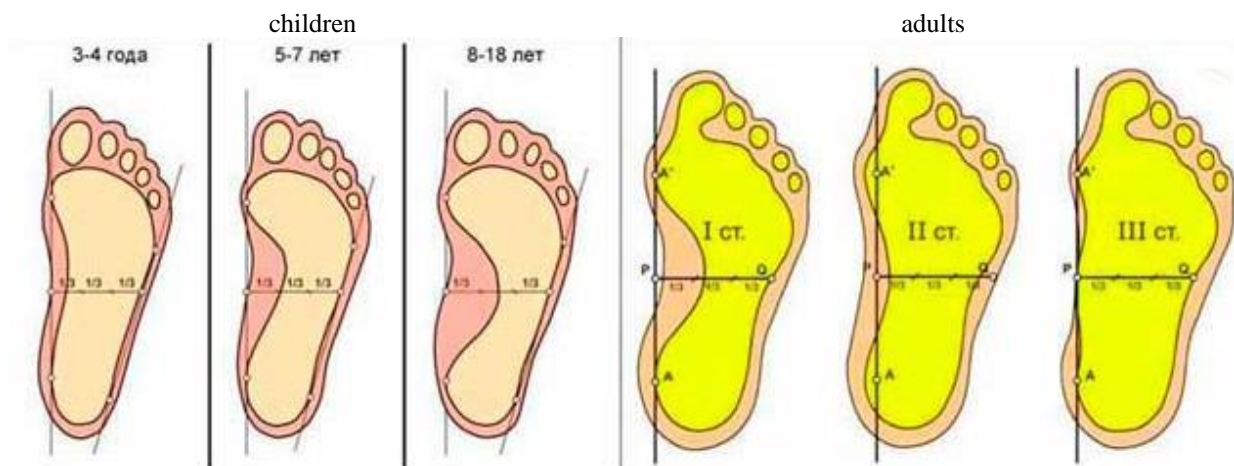


Figure 9 - Features flat feet in children and adults

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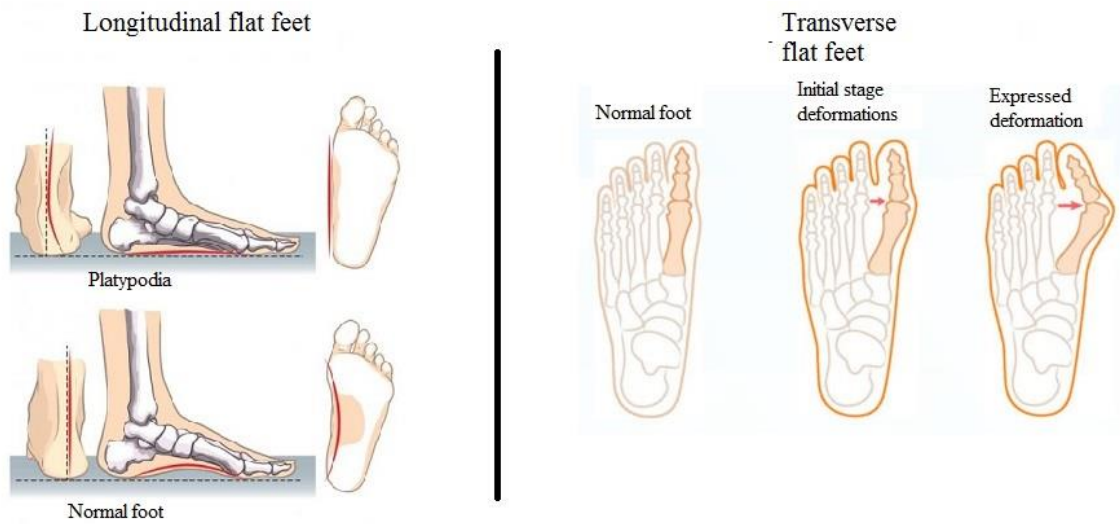
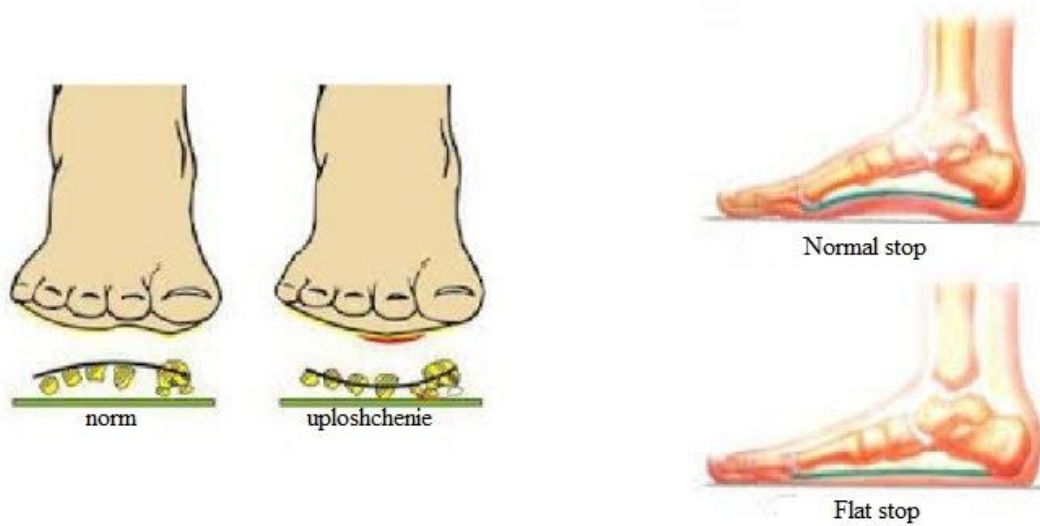


Figure 10 - Features of the transverse and longitudinal flat feet

Types of flat feet



and - the longitudinal

b - transverse

Figure 11. Types of feet in children and adults

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Figure 12 - Assessment of flatfoot



Figure 13 - Measuring step with disabilities patologichiskimi



Figure 14 - Selection of corrective components to the stop with pathological abnormalities

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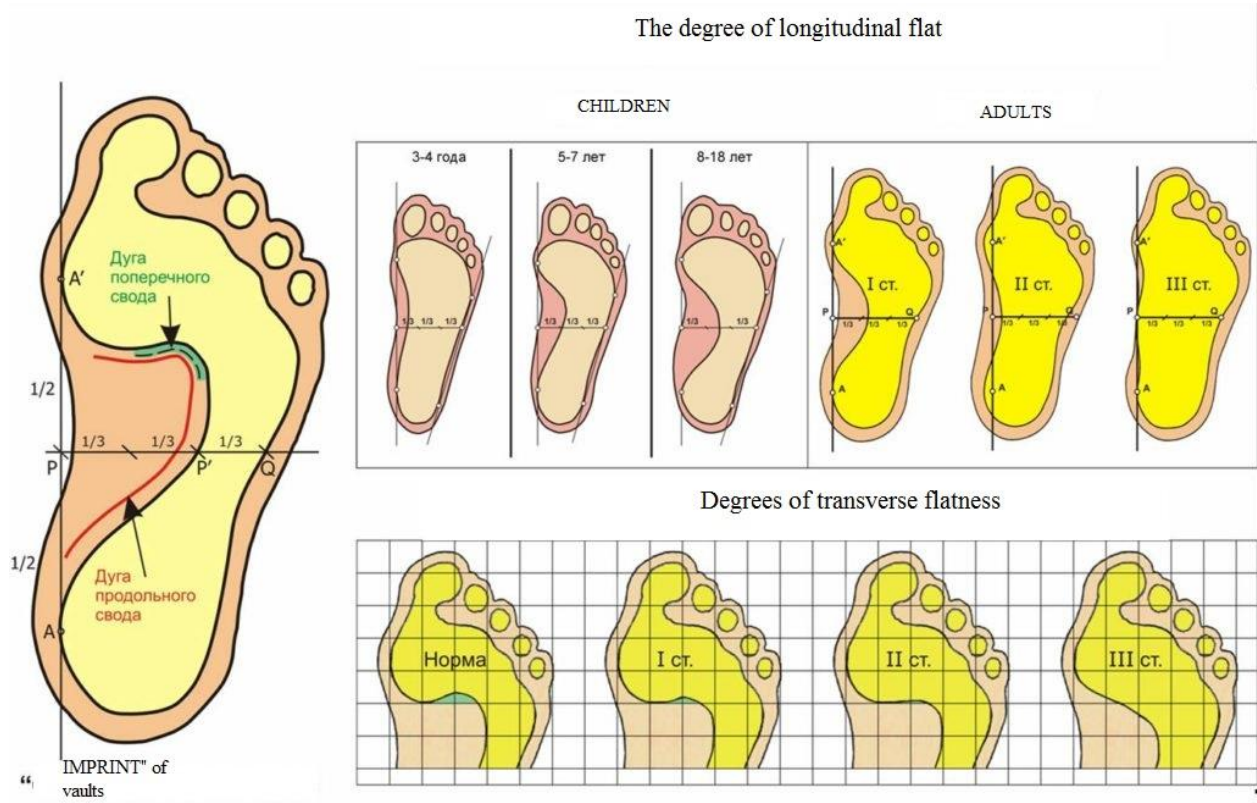


Figure 15 - Feature degree flatfoot feet in children and adults

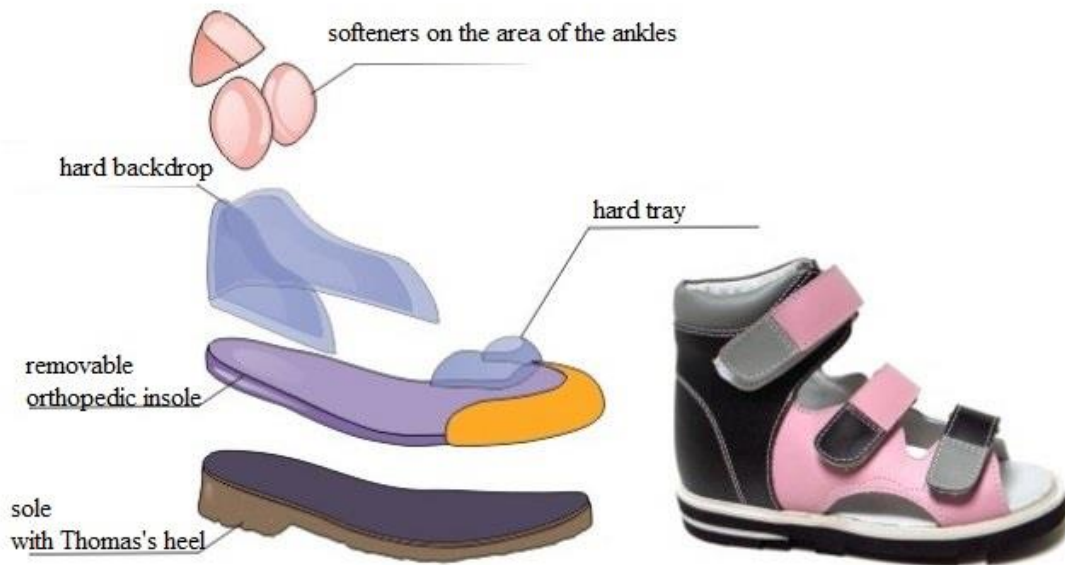


Figure 16 - Diagnostics flatfoot

Diagnosis is confirmed flatfoot plantography - yield footprints. To conduct plantography use plantography. Frame with a stretched on it waterproof fabric on the underside, greased paint. Surveyed child puts his foot on plantography and gets up with a uniform load on both feet. Investigated encircle the

foot. Sometime between 3 and 4 fingers at the level of the metatarsal heads to finish. On plantogram connect this point with the center of the heel. The resulting line is the boundary of the cargo and the spring arches. Normally, a set of truck is painted, spring type - free. There are other ways plantogram processing. Figures

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plantogram healthy examples (1) and the plane (2) stop. Sometimes it is necessary to clarify the diagnosis X-ray (Figure 12-13).

Recognition flatfoot diseases in children has some features have been stop growing organism passes certain stages of the formation to be considered.

Anatomical studies have shown that infants arch are well expressed. However, a vaulted structure is masked richly developed subcutaneous fatty tissue, and when viewed from the sole of the foot appears flat. From the second year of life, when the child begins to walk and learning to run, there is a real decrease of the longitudinal arch of the foot under the influence of the load on the still immature foot. With 3 years of age there is a significant development and strengthening of muscles and ligaments, so there is a gradual increase in the height of the arch. Thus, the structure of the foot arch structure increasingly gets its external shape. The older the child, the better during the inspection he expressed the arches of the foot. Thus, the planar shape of the foot outwardly at younger children can not be attributed to a true disease flatfoot, but is only a phase of normal development. It should be remembered that the flat foot as the version of the rules can be preserved for a lifetime and not cause thus no functional disorders (a person may do any work on the feet, with the rise of weights, and thus there is no pain). Due to the already mentioned anatomical and physiological characteristics of children when determining the flat foot of the sole of a print can be a mistake, since all or almost all children are flatfooted in early childhood. And if there is any doubt in

determining the nature of flat feet, the child (the patient) should be sent for consultation to a specialist - an orthopedic surgeon. Therefore, in addition to the patients' complaints, bone and cartilage skeleton of the foot is to determine the most appropriate location.

Types and causes of flatfoot

Analysis performed studies suggests three basic functions inherent in the normal foot: spring - the ability to elastically spreading under load; balancing - participation in the regulation of late activity during standing and walking; pushing - message accelerate common center of mass of the body in locomotor act. The most important design feature of the human foot is its vaulted structure. Since the longitudinal and transverse arch convexity facing upward, then the vertical posture on the sole pressure is distributed mainly on three points (calcaneal tuberosity, head I and V metatarsal bones) and the outer edge of the sole. Therefore, the effective area of the foot support is less than the area of its sole. foot vaulted to maintain and strengthen the muscles of the lower leg, so its damping properties are determined not only by anatomical features of its bones, but also active work myshts. Chelovecheskaya leg by nature very well designed. human foot in the process of evolution has acquired a form that allows to distribute the load evenly. But the ideal stop occurs in less than half of humanity. According to scientists from the world's population suffer from flat feet 40 to 80%, of which 90% are women.

Distinguish 5 types of flatfoot:

Static flat - 82.1%	The reason - Reduced muscle tone
Paralytic ploskostopie- 5.7%	The reason - a consequence of poliomyelitis
Traumatic flat stopa- 6.2%	The reason - the result of fractures of the tarsal bones
Rachitic ploskostopie- 3.2%	The reason - Rickets
Congenital flat stopa- 2.8%	The reason - Malformations of conception, amniotic constriction, etc..

Types of static flatfoot

Acquired longitudinal flat feet: in this disease occurs foot deformity with flattening of its longitudinal arch. Causes of longitudinal deformation of the arch are varied, depending on the state of the musculo - ligamentous apparatus and bone calcium content of external influences.

Traumatic shape deformation - as a result of fractures of the foot and ankle bones, soft tissue damage, reinforcing arch.

Paralytic strain - develops as a result of paralysis or paresis of the muscles that support the arch of the foot. This stops the deformation characteristic of the transferred polio stasticheskikh paralysis, spinal cord diseases. Muscles, longitudinal retaining arch (Figure 17).

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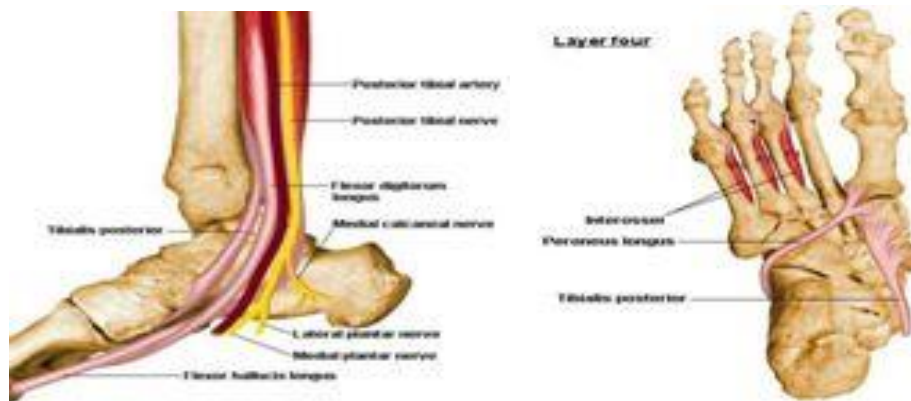


Figure 17 - The muscles that hold the longitudinal arch of the foot of the child

Static deformation stop: It develops as a result of overloading of the foot. The reason may be a rapid increase in body mass (obesity, pregnancy), heavy physical work associated with the load, as well as depletion of the compensatory capacity with age, general atrophic phenomena (bad food, prolonged fasting, et al.).

Diagnosis longitudinal flat justified doctor - orthopedist on the basis of clinical examination, radiography and plantography. Patients pay attention to the appearance of fatigue in the lower extremities. Frequent and recurrent pain in the feet of the longitudinal arch in the legs when walking, to the end of the day. With the development of the disease begin to disturb pains in the hips, waist. As a consequence, gait disturbance, edema appear feet, ankles, feet joints develop arthritis.

For surgical treatment of longitudinal deformation of the foot resort rarely, in exceptional cases. Treatment longitudinal flat conservative advantageously directed to pain relief and the prevention of deformation of the stop progression. Apply a warm foot bath with salt solutions, with a decoction of herbs, foot massage. Therapeutic exercises aimed at strengthening the musculo-ligamentous apparatus of the foot. This exercise flexion and supination stop, bending and straightening toes, c using objects: a ball, a rolling pin, etc. If severe pain is recommended limiting the load on the foot, often - bed rest for 2-3 weeks, and then a foot massage and physiotherapy. Physiotherapy treatments include paraffin and ozocerite baths, hydrocortisone phonophoresis, electrophoresis of novocaine. It is necessary to regularly repeat courses of conservative treatment for a year. Patients suffering from a longitudinal flat feet, recommend wearing orthopedic shoes, individual orthopedic insoles that allows you to create a comfortable position for the foot.

Cross-acquired flatfoot:

The most common cause of transverse flatfoot - the constant improvement of the static load on the foot

on the background of constitutional predisposition, at least - as a result of postponed injuries, diseases of the nervous system. Cross flat - a consequence of failure musculo-ligamentous apparatus in conjunction with the functional weakness of muscles of the foot and lower leg. However, it remains controversial role of muscle weakness in the formation of cross flatfoot, since there is no foot muscles that bring together the metatarsals. However, electromyographic studies have indicated on the primary changes in the functional properties of the lower leg muscles and feet during the development of cross flatfoot. The muscles that support the transverse arch of the foot. Cross clinically flat foot deformity. This large deviation of the toe (1st finger) at the side; osteochondral growths on the inner edge of the head of the 1st metatarsal bone; tensioning tendons of the extensor toes (under the skin on the rear of the foot); callous skin appearance on the sole of the foot; so called hammertoes deformation of the 2nd, 3rd toe. With the development of the deformation of the foot on the protruding towards the inside of the head of the 1st metatarsal bone is constant pressure shoe, which is one of the causes of osteochondral growths on the medial edge of the bone and the development of bursitis of the 1st metatarsophalangeal joint. The deflected outwards 1st finger and Hammer deformed 2nd and the 3rd toe more strongly subjected to the constant pressure shoe edges. This results in the formation of ingrown nail 1st toe, the appearance of blisters on the knuckle region of the 2nd and 3rd finger.

Diagnosis cross flatfoot vrach orthopedic sets on the basis of clinical examination, plantography and radiological investigation. Patients with acquired transverse flatfoot, usually complain of fatigue of the lower limbs when walking or prolonged standing. It is also concerned about the periodically appearing pains in the head of the 1st metatarsal bone, pain on the part of the sole, in the projection head 2nd and 3rd metatarsal bones. All this leads to difficulties in the selection and shoes. Treatment of acquired flatfoot is usually conservative cross - aimed at eliminating pain

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and preventing further progression of the foot deformation. The complex of traditional conservative treatment includes: warm foot bath with salt solutions, with a decoction of herbs; physiotherapy and massage the feet and legs.

Useful techniques include physiotherapy ozocerite and paraffin baths, electrophoresis drugs (Novocaine solution, etc.), Phonophoresis with hydrocortisone. Also used are varied, corrective foot, adaptations: silicone cuff worn on the forefoot; interdigital spacers between 1st and 2nd toes; individual orthopedic insoles for continuous wear shoes. When the level 1 cross flatfoot typically use only conservative methods of treatment. Since eliminate deformation develop stop conservative techniques can not use the surgical technique and the correction of the foot, according to indications. In the 2nd and 3rd degree cross flatfoot accompanied by persistent pain, impaired function of the foot (support and walking), progressive deformation of the foot, and failure of conservative treatment methods - use surgical treatment.

The clinical picture of flatfoot:

Clinically, doctors - orthopedists distinguish 5 stages of flatfoot:

1.Prodromalnaya stage. When the first stage is increased fatigue when walking, and by the end of the day there are changes in the foot - sweating, "corns" of corn. There is an increased sensitivity to microtrauma pain after prolonged static load, fatigue towards the end of the day. Decreased physical performance, expressed general fatigue. There may be headaches as a result of reducing the spring function of the foot. The overall result of all this - sleep disturbance.

2.Stadiya intermittent flatfoot. Expressed increased pain in the foot by the end of the day. The longitudinal arch of the foot at the same time visually sealed, after a rest recovers. Maybe a certain swelling of the feet and coming (time) contracture of the muscles. By morning, these symptoms disappear. Already at this stage there are changes in the knee joints, swelling in the ankles, blood circulation in the lower extremities, which is manifested in the weight of the legs, orthostatic edema. Pain in the feet leads to a decrease in motor activity: preference is given to the movement of the vehicle. Lack of muscle mobility leads to disruption of the microcirculation, changes in the lymph-venous outflow. At these two stages significant visible change in the feet is not present, and only disadvantages result in the concomitant beautician dermatologist.

The main complaint in this case - thickened, loose tissue in the knee joint, which is not always fat origin: the increase in volume is obtained by mikrovyypota of the knee joint, which is also suffering because of flat feet. In other patients, the pathological

process is localized in the ankle: he becomes a broad, swelling and losing its elegance.

3.Stadiya development of flat feet. Rapidly developing fatigue as a result of overwork muscles. Pain is constant and nagging. Reducing the height of the longitudinal svoda.Otchotlivo visible deformation of leg contours of the navicular bone isolated at the medial (inner) edge of the foot, heel bone is deflected outwards, acting as an ugly protuberance usually bluish-red color, easily injured until scuffs. Ranges gait, as limited range of motion in joints stop.

4.Stadiya ploskovalgusnoy foot. Longitudinal arch flattened dramatically. When walking, the pain appears quickly in the inner ankle. Expressed reflex spasm of the muscles of the foot and lower leg. Tendons in the rear foot pointed. There is a deformation of the thumb to form a "seed" and rough calluses. The latter is often combined with callous borodavkami.Patsient draws attention to the plantar wart and comes to a dermatologist is usually too late when already there is pain. Cause callous warts is also flat. Therefore, without concomitant orthopedic correction treatment may be ineffective.

5.Stadiya contracture flatfoot. Pain in the foot constant. The foot is in pronation cutting position (tread down the inner surface). Visibly disturbed and impeded gait.

Prevention of flatfoot

Prevention of flatfoot in the earliest stages involves the timely and proper treatment of rickets, diseases of the central nervous system, strengthening muscles and capsular-ligament apparatus of the lower limbs using the gym and massage. In the later period, from the year when the child develops a vertical posture, walking, not least the wearing of rational shoe.Walk barefoot or in socks on the floor of pre-school children is harmful. They can walk barefoot on sand, gravel, grass, ramp up and down on peas, beans. For the prevention of flatfoot and strengthen the muscles stop useful insoles simulator Planta, in which REDD is lined with massage elements. These insoles are recommended to wear no more than 5-6 hours a day. It is convenient to put insoles in shoes Plant, which the child is in child care. Time of activity of the child in preschool is approximately equal to the recommended time to wear insoles. Over the weekend, the child does not attend preschool and foot rest. If there are defects foot orthotics are useful to facilitate correction of the defect or to carry out special correction shoes.

Flat feet and foot deformities any aetiology

During the formation and differentiation of the child's foot is a high risk of its deformation. Foot deformity in children due to the fact that the child in an effort to increase the contact area, is trying to

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arrange his feet as much as possible - in this case the maximum specter internal departments feet. Impacts and increased extensibility of the ligaments and bone strong enough machine. Particularly high risk of events such as valgus and varus deformation, less common deformity of the toes doctor - orthopedist should be laid potologicheskoe deviation and gives recommendations to parents and child on the activities that they have to be realizovanna with his participation, to facilitate the child his condition and cause the correction availability he abnormalities.

According to experts of the St. Petersburg Scientific and Practical Center of Medical and Social Expertise, Prosthetics and Rehabilitation them. G.A.Albrehta orthotics to 140 size to be produced only individually by appointment podiatrist.

When flatfoot due delayed development vaults shown svodoformiruyuschie insole and polustelki manufactured computation with internal and external longitudinal arches of the foot, which are disposed between the sections and 0,20L 0,60L. The maximum height of the longitudinal arch calculations, both internal and external is identical. It is at the level calcaneocuboid articulation, ie, for sizes from 140 to 200 - 0,36 L in cross section and is from 5 to 7 mm, for the dimensions of 245- 205 with a sectional 0,33L and ranges from 8 to 10 mm. The value relative to the face of deepening the insole in the heel is 3-4 mm for children and small children insoles and 5-6 mm for the rest.

When functional insufficiency musculo-ligamentous apparatus and moderate static nonfixed flat foot and the insole are assigned svodopodderzhivayuschie polustelki manufactured computation with internal and external longitudinal arches of the foot, which are disposed between the sections and 0,20L 0,60L. In this layout the inner arch above calculations outdoor. Location calculations maximum internal and external longitudinal arches is at calcaneocuboid articulation similar to that described above. Depending on the size of the display of the outer foot arch is from 5 to 8 mm and inner of 9 to 12 mm.

Conclusion

It was found that the anthropometric study and stop the development of science-based requirements for the design of footwear for children and teenagers is a topical issue for the footwear industry. It was determined that the main factor in the formation of the requirements for shoes for children's shoes should be the preservation of health, as this age are the most vulnerable to vleyaniyu external environment on the formation of their potologicheskikh deviations their feet. The place of the shoe in combination of health factors. It is proved that the shoe has an impact on all categories of health: somatic, personal and social.

Using the standard footwear of mass production means of orthopedic technology in loose insoles and other supplementary devices can serve as an effective means of improving its preventive properties, including for the prevention of children flatfoot foot. To do this, specialists in the design and manufacture of footwear of mass production should timely receive current information about the new designs of these orthopedic appliances, as well as the indications for their use.

On the basis of studies to determine consumer preferences revealed that realized now baby shoes with prophylactic properties has some drawbacks concerning both materials and design, and external signs.

Parents of children with abnormalities, including with flat feet, experiencing an obvious flaw in the children's prophylactic footwear domestic production. established its basic design features based on analyzing preventive footwear. Shoes with prophylactic properties of a certain segment of the consumer market of Child and Adolescent shoes. It is distinguished by the presence of design solutions, providing maximum comfort to wear, the presence of special parts (ins anatomical insoles, polustelki, calculations and other flavoring components), a rational evidence-based internal form of footwear and application of high-tech materials in the manufacture of shoes, their tough selection for physical and mechanical and hygienic parameters. On preventive footwear experimenting with new designs and materials to ensure maximum comfort to the child, and the creation of necessary conditions for it to prevent disease and foot deformities.

To solve the problem tight fit of the foot of the child and to provide the necessary rigidity of the heel portion of the shoe upper backs proposed design, retaining the ankle still further by laces, straps or "sticky."

For fixing the ankle proposed construction of the shoe heel, in which a certain stiffness is created at the expense of process parameters, namely the heel portion uses an additional assembly of the outer member, the intermediate member and the lining.

The developed designs uppers with anatomical arch support provide the most effective support arch and correction of the angle of her naklona. Takim, it is important to have a permanent union between a doctor - orthopedist and manufacturers corrective detalny to garanitrovat stop child comfort and high confidence to him and his parents on the prevention education at their child patolgicheskikh deviations.

the continuation (second part)

Introduction

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Now the problem of the prevention and correction of deviations in the health of pre-school children has become particularly relevant. This is primarily due to the large number of preschool children (84.9%) with different deviations in health status [1]. In this regard, it is increasing the value of the organization of the preventive and corrective orientation directly in the conditions of preschool educational institution (DOW), where the child is an almost daily basis, and where, consequently, it is possible to ensure timely and regular exposure. However, the current system of rehabilitation of children in preschool practically not formed. Marked dissociation of the medical and teaching staff in the provision of correctional help to children, there is clearly a lack of awareness of teachers and parents in the corrective and preventive issues of development, training and education of children . Despite the declaration of the traditional importance of early detection and correction of deficiencies in mental and physical development of children, correctional and pedagogical activity has not become a priority in the actual practice of the education system, although it should be regarded as a mandatory component of the state educational standard [1].

During the organization of the preventive and corrective direction in a preschool special attention should be paid to the prevention and correction of violations of the musculoskeletal system (postural defects, flat feet), because they have the largest share among the functional abnormalities. In particular, the studies found that 67.3% of children of the senior preschool age have flat feet.

The foot is the support body foundation, so it is natural that a violation of this foundation is necessarily reflected in the formation of the growing organism. Changing the shape of the foot, not only causes a decrease in its functionality, but also, more importantly, changes the position of the pelvis and spine. This adversely affects the function of the latter and, consequently, posture and general condition of the child. Insufficient development of the muscles and ligaments stop adversely affects the development of

many movements in children, leading to a decrease in motor activity and can become a serious obstacle to many sports . Thus, strengthening of the musculoskeletal system, and in particular the foot, is of great importance.

It is interesting to note that the formation of the right arch of the foot in children, as well as the prevention and correction of functional impairment attached great importance to the national traditions of education. For example, in the preparation of the child to the development of skills and pryamostoyaniya walk to strengthen the muscles of the foot has been taken lightly poshlepvyat on the soles of his feet, saying:

Kui, Kui, kovalok, horseshoes Chebotok: On a small nozhkuZolotu podkovku.Poday molotokPodkovat Chebotok!

And although much of today is lost for centuries selected by the invaluable experience of folk pedagogy, such pestushki, nursery rhymes, rhymes, so-called small folklore genres, reflect the tradition and philosophy of its founders.

At preschool age stop is under intense development, its formation is not completed yet, so any adverse external influences may lead to the occurrence of certain functional abnormalities. However, in this age period characterized by great plasticity body, so it is relatively easy to suspend the development of flatfoot or fix it by strengthening the muscles and ligaments of the foot.

Successful prevention and correction of flat feet are possible based on the integrated use of all means of physical education: hygiene, natural and health factors and physical exercise (see table.).

Main part

Valgus foot deformity in children

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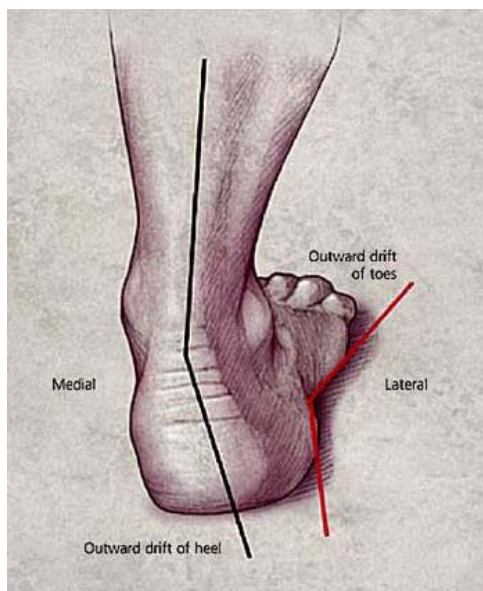


Figure 1 - Ploskovalgusnaya stop at ditey

"Flat-valgus setting stop" - that this diagnosis is very often hear parents of pediatric orthopedics. If the word "flat" everything seems to be, it is clear that the second part of the diagnosis - "valgus" is not so obvious. And in general, what is this disease and what to do requires some explanation. Valgus - simply put - X-shaped installation feet. Everyone knows what "iksikom feet" - the same thing, and with the feet. Foot flattened and "littered with" inside - this is a flat-valgus feet.

The diagnosis of "flat-valgus (or X-shaped) production stop" is placed sufficiently often. With this deformation flattening of the foot and the like fall down inward. The reason - the weak ligaments child's feet do not always withstand the body load. Accordingly, the flattened longitudinal arches, and the foot inner edge sags, anterior removed. If you look at a photo of flat feet in children from above, it will be

clearly visible to the letter "X". The first signs of the X-shaped setting foot can be traced back at the very first steps. The main thing - immediately identify violations, to conduct timely treatment of foot deformities.

Varus foot deformity in children

Signs varus setting foot - bent in an O-shape knee joints, they are not joined together in a straight line. Hence, when walking child will rely on external arch of the foot. Such strain most common in infants and in children with cerebral palsy, brain tumors, diabetes.

Timely diagnosis of pathologies and successful correction of clubfoot treatment of flat feet in children is possible - it is necessary to visit a podiatrist and implement its recommendations.



Figure 2 - The characteristic varus foot deformity in children a) X-shaped b) "littered" inwards

This happens because weak ligaments child's foot can not withstand the load of the body. Flattening of the longitudinal arch leads to sagging of the inner edge of the foot and disposal of the anterior. Since

forming X-shaped installation stop. Pervye features flat-valgus foot installation appear simultaneously with the first baby steps.

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Customized orthotics can effectively adjust the flat-valgus feet and installation in conjunction with a children's orthopedic shoes provide the foot of the child the correct position. Very important in the treatment of a strengthening of the musculo-ligamentous apparatus of the foot. Therefore, therapeutic exercise for feet is a required component.

Features flat-valgus deformity of the foot

As you know, stop adult has a vaulted structure. Longitudinal and transverse arch operate spring, a balancing function, and are also involved in adaptation to the supporting surface of the foot when walking. The arches of the feet of the child up to 3 years have not yet formed. Due to the significant amount of stop subcutaneous fat child at this age it seems almost "flat". With the growth of the child height of the arch increases, and for each age group is characterized by a certain height of the longitudinal arch. [2]

Since, on the foot and, in particular, on the plantar its surface located projection "of the various organs of the human body. From this perspective, to maintain a normal state of health is necessary to use only rational footwear that promotes the normal life of the people. This is especially important for growing children's feet, the more -. feet with different strains According to various studies among the most common foot deformities is flat and one of its variants - with a flat-valgus. Tops She accompanied the following deviations:

flattening of the longitudinal arch; valgus position of the hindfoot;

abduction-pronation position of the anterior [3].

The maximum percentage observed in children of primary school and preschool age. However, the physiological flat feet, even in the age of 3 years, should be distinguished from the pathological, when the reduction of the longitudinal arch combined with a valgus deformity of the foot. If the angle of heel valgus deviation of the three years of the child's foot more than 70, then we can talk about the flat-valgus foot. An indirect indication of the foot valgus plane child can be considered typical wear heel, preferably at the inner edge of the shoe, and deformation backdrop. Very often the child with flat-valgus feet, complaining of pain in the knee and ankle joints that occur during exercise, he is tired of walking and running. Flat-valgus deformity requires stop of orthopedic treatment. Lack of adequate treatment, as a rule, leads not only to a change in shape of the foot, but also to the spinal deformity: violation of posture and scoliosis. Flat-valgus deformity stop - very frequently occurring type of deformation. Thus the arches of the foot and heel of the foot is reduced deflected outwardly. More common in children. This gives rise to fatigue while walking, pain in hip and knee joints, swelling. Shoes tend to be distorted,

deformed, worn inside of the heel. Flat-valgus deformity, if untreated, usually leads to violation of posture and scoliosis. The result - a pelvic imbalance, the shortening of one leg, back pain, intervertebral hernia and other problems. The most common cause plano-valgus deformity is hypermobility of joints, weakness musculo-ligamentous apparatus. With age, may develop degenerative changes of bones and joints of feet, poor circulation. Treatment, especially at an early age, aimed at strengthening the muscles of the arches of the foot and lower leg. The survey orthopedist will determine the degree of deformation, select the desired program stops correction and manufacture customized orthopedic insoles or orthoses required for a particular patient. We recommend you consult our experts at the numbers listed at the top of the site. Also, please note that arranged appointment system that will allow you to get the most comfortable service in our salon. For a long time there was no generally accepted clinical classification plano-valgus deformity. Known classification were based on the expressed signs of deformation and the stages of its development. For example, PP-known classification of the damage which is based on the main clinical forms of flat feet, representing a number of gradations that affect the choice of treatment:

- prodromal form of flat feet; intermittent flat;
- simple form of flat feet; flat, complicated abduction
- forefoot; contracture flat[3].

Additional classifications developed flat-valgus stop most widespread dysfunction classification posterior tibial tendon (SZBBM) Johnson KA and Strom DE Myerson modifications in []. At the heart of it lies the connection between the elastic flat-valgus foot dysfunction and the development of posterior tibial tendon - the more pronounced the plane valgus deformity of the foot, the faster the degenerative changes in SZBBM more rigid and resistant is a flattening of the inner longitudinal arch. To the proposal of the three stages of development of a plano-valgus deformity Myerson MS added a fourth step, which is described degenerative changes in the ankle joint. This classification is sufficiently informative, because it includes the set of attributes valgus plane and the stage of its development. Classification flat-valgus foot deformities in children. Statistically, almost every kid under 5 years of age, having a developmental disorders stop (40-80%), also has a diagnosis of "flat-valgus deformity stop".

In children, the flattening of the arch of the foot, usually occurs at a time when the baby is just taking its first steps; this is due to quite severe loads on the legs when trying to make a move. Of course, we can not wait on the baby perfectly correct statement of the stop or gait "from the hip" as soon as he first stood up on its feet.

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Plano-valgus is accompanied by the following variations:

- flattening of the longitudinal arch;
- abduction-pronation position of the anterior;
- valgus position of the hindfoot;

The maximum percentage observed in children of primary school and preschool age. Although there are cases where the diagnosis can be considered as unauthorized.

The shape of the foot, which was formed in the course of evolution, provides an even distribution of body weight. Foot bones, strong interosseous ligaments are connected, form its vault, whose role - to provide maximum cushioning movements during running and walking. Convex arches are oriented in two directions - longitudinal and transverse. Therefore, in a normal adult human foot three points of support - the head of the first metatarsal, metatarsal tubercle and the fifth metatarsal bone. In children, the flattening of the arch of the foot, usually occurs at a time when the baby is just taking its first steps; this is due to quite severe loads on the legs when trying to make a move. Of course, we can not wait on the baby perfectly correct statement of the stop or gait "from the hip" as soon as he first stood up on its feet. As a rule, the first complaint parents have when a child takes its first independent steps. In this case it is necessary to clearly distinguish between the physiological flattening of the arch of the foot of the child, who has not yet reached the age of three years, and the actual flat-valgus deformity, which already requires monitoring podiatrist. Up to three years in children on the plantar aspect of the foot has a "fat pad", so by simple visual inspection of the foot arch is not visible. But it will be noticeable if you ask the kid to stand on tiptoes. Bone in the child continues to be formed before the 5-6 years, so that only in this period makes sense to start talking about the absence or presence of the baby itself plano-valgus deformity. However, it should be borne in mind that the flat-valgus feet in children can lead to negative consequences such as:

- severe curvature of the spine;
- persistent pain in the legs;
- "Adult" disease - osteochondrosis, arthritis.

In some cases, the diagnosis of "valgus foot" put the child back in the hospital. In this case there is a congenital disease character (vertical ram).

Causes of foot deformities:

- dysplasia, connective tissue (78%).

Contaminated water and air, low-quality food products leads to the fact that the connective tissue, which is the basis ligament apparatus of the joints (and all other organs) formed correctly.

- wrong baby shoes (soft model with a flat sole, not able to properly fix the leg).

• the baby is not engaged in physical training in preschool uchrezhdeniyahi family.

• Genetic and endocrine (diabetes, thyroid disease) disorders.

• osteoporosis (bones lesion).

• various foot injuries.

Doctors allocate a number of theories with which to explain the etiopathogenic mechanisms:

• anatomical theory;

• vestimentarnaya theory;

• static-mechanical theory;

• Theory of hereditary muscle weakness;

• theory of constitutional weakness of connective tissue.

Physicians are three severity flat-valgus stop: an easy, medium and heavy. So-called stop - Rocking (vertical ram stop paperweight) - the most severe degree of deformation. Revealed she immediately at birth, the incidence of detection - 1 in 10,000 newborns. Etiopathogenesis of this deformation hitherto not completely understood. The most likely cause of the deformation doctors isolated malformation germ and delay its development in one of the stages of formation of the embryo.

foot parameters are normal:

if to hold two lines - the lower contour of the calcaneus and first metatarsal - so that the vertex angle was in the region of the navicular bone, this angle must be 125 °;

longitudinal arch height - 39-40 mm;

valgus position hindfoot - from 5 ° to 7 °;

calcaneus inclination angle with respect to the support plane - from 20 ° to 25 °.

The height of the longitudinal arch of the foot in children of preschool age in the norm may be 19-24 mm.

Mild characterized by the following parameters:

• the height of the longitudinal arch of the foot is reduced to 15-20 mm;

• angle roof height is reduced to 140 °;

• calcaneus angle - 15 °;

• hindfoot valgus position - up to 10 °;

• allocating forefoot (8 ° -10 °).

Average rate:

• arch reduced to 10 mm;

• height of the arch is reduced to 150 ° -160 °;

• angle calcaneus to 10 °;

• valgus position of the hindfoot and

retraction of the front - to 15 °.

Severe:

• arch of the foot is reduced to 0-5 mm;

• angle of the foot arch height reduced to 160 ° -180 °;

• angle calcaneus - 5 ° -0 °;

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- valgus position adjustable diversion of the front card and - more than 20 °;
- deformation under severe rigid and can not be corrected;
- constant pain in the joints Shoparova.

-Osnova stop, "foundation" of our body. And if the foundation of the curve, and the smooth, reliable home on it does not build. Flat-valgus deformity stop entails valgus (X-like) deformation of the knee and ankle joints, incorrect positioning of the pelvis, incorrect posture. Curvature of the spine and extremities axes leads to an overload of the muscles that are unsuccessfully trying to hold the body in the correct position. As a result - the appearance of pain, the early development of arthritis, degenerative disc disease. Appropriate measures should be considered for the timely prevention of the progression of adequate orthopedic SNA software, the need for which, according to different authors, have up to 78% of the population. Traditionally, orthopedic providing limited purpose of orthopedic shoes or insoles invested in normal shoes. Orthopedic insoles are made of prosthetic - orthopedic company. In recent decades there have been attempts to create, in particular, loose orthopedic insoles for monkey - lichenie consumer. However, limited design options and a number of other shortcomings are not allowed to significantly change the nature of the orthopedic provision as a whole. The reason for the flat-valgus feet of the child, as a rule, is a joint hypermobility. Weak muscles and ligaments do not "hold" the weight of the child and there is pronation (valgus deviation) of the foot. Treatment of flat-valgus feet of the child held in a complex. It is necessary to carry out activities aimed at strengthening the musculo-ligamentous apparatus involved in svodo- hold. It is a complex of medical gymnastics, massage, physiotherapy. It is necessary to carry individual orthopedic insoles, corrective flat-valgus foot child.

When designing the children's shoes the requirements of comfort and convenience, highlight. The quality of children's shoes is determined not only by its durability and relevant aesthetic design, but comfortable enough, which refers to the ability of the shoe to provide conditions for the normal functioning of the foot [4]. Comfortable shoes is a comprehensive indicator of the properties, which can be subdivided into three groups:

- the first group consists of the physiological properties of providing normal biomechanical functioning of the foot;
- the second refers hygienic properties that affect the safety and the harmlessness of the conditions of her toes; third characterizes the footwear in terms of its rationality and amenities represents anthropometric characteristics;

- the third group properties include the spacer and the supporting rigidity priformovyvaemost and compression foot shoe, which depends on the magnitude of occurring pressure.

Special interest for shoe comfort evaluation index "Pressure shoe upper on the foot." The pressure shoe upper on the foot and the character of its change during wear primarily depend on the dimensions and internal forms of footwear defined size and shape of pads. Furthermore, due to increasing the size of the foot creates an additional pressure caused by the properties of the workpiece material and its shoe design. It is known that in the motion volume increase unshod foot in the metatarsophalangeal articulation averages 4%. The initial size of the foot and do not remain constant throughout the day. Their change is influenced by the duration and intensity of the walk, as well as the microclimate of vnutriobuvnom space. Increasing the temperature and humidity of the foot leads to an increase in its volume, and consequently affect the compression foot shoe size. Excessive pressure adversely affects the physiological state, which is manifested in a change mode vlagotemperaturnogo [5], the offset center of gravity, the accumulation of static electricity on the skin. As a result, the child experiences discomfort manifested in fatigue of the lower limbs and the occurrence of pain. In addition, prolonged pressure on the shoe upper forefoot promotes various abnormalities. Enhance comfort of the group shoes contribute soft edges and gaskets used in models of uppers. Equally important in the development of comfortable shoes are materials used for the top and bottom parts, which must be different softness and flexibility, as well as fastening methods. Bespodkladochnoy for manufacturing shoes as the materials can be used elastic top skin, including the skin of increased thickness, and artificial textile materials, characterized by properties similar (especially hygroscopic) to elastic natural leathers. On comfort (in particular, hygroscopicity) influences lining used in shoes. This usually chrome leather tanning drum or dyeing aniline light colors, and textile materials. Thermoplastic backs and toe must have the softness and elasticity to be dimensionally stable. One of the main conditions that reduce the rigidity of the spacer shoe, a design shoes children's shoes. Forms the toe portion recommended for children's shoes - advanced oval and rounded square - predetermined stability shoes. Reference comfort as an integral component of the shoe reflects the notion comfort conditions most favorable interaction of the plantar part of the foot with a shoe bottom of the system which are determined by an array of optimal parameters obtained by contact normal human foot having an average weight of soil. The complex evaluation criteria reference comfort three basic, according to which should be administered design changes

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calculated characteristics and chosen shoe bottom materials system, namely:

- -distribution pressure on the supporting surface of the foot (criterion - the pressure distribution);
- -reaction on the heel portion side in the base body mass transfer phase on the support leg (criterion - suspension);
- -voltage arising in the plantar muscles and ligaments of the foot under load (test force - raspornoe).

The transition from the interaction of the foot with the ground elastoplastic to contact with a rigid system shoe bottom - asphalt (concrete) causes the appearance at selected sites plantar portion of high stress concentration, as the interaction is realized through a reduced force of about 1.3 times the contact surface. This makes it necessary to lead to an optimum pressure distribution due measurable neniya-elastic and geometric parameters of the support. One of the essential conditions are respected for the design of shoes with the supporting comfort should be basic setting profilirovannoy insole with special liner and made of foamed material, allowing it to easily priformovyvatsya foot. The problem of designing comfortable shoes can not be solved without the revitalization of the related industries, developing for this shoe materials and products. Indices of comfort of footwear, such as its convenience, ease, softness, elasticity can be only achieved, provided that the components and articles of footwear materials have corresponding properties. It determined that the footwear is one of the factors affecting the formation, development and normal functioning of the body of teenagers. Thus, the flattening of the foot leads to a violation of posture, spine diseases, wrong location, and hence the work of internal organs. Reducing the physiological curves of the spine (flat back), especially in combination with flat feet, leads to permanent brain microtrauma impaired memory and attention. Such a chain can be built, and in the analysis of the effect of footwear on the emotional development of adolescents, on which depend the

personal and social health. To do this, you need to understand how the process takes place social child gets older, and what importance is its appearance, and hence the consumption of items such as clothing and shoes. [6]

Corns, abrasions, crooked fingers and feet in general, etc. Objects of consumption, which form the external image of the teenager are not just elements of the costume for him, but also a way to express their individuality, to express their concerns and to identify membership in a particular community. The absence of a teenager's wardrobe shoe style inherent to his comrades, can not serve as an understanding on their part. A conflict in relationships with peers generate heavy experience, teenagers are considered as a personal drama, therefore, reflected in the personal and social health. Another possibility is the effect of footwear on the psycho-physiological and social health of adolescents lies in the characteristic of this age of increased self-criticism of its external data. shin completeness, big or small size of the foot, the disharmony in the leg proportions - all this can be a complex and an adult, but like a teenager discontent lead to more severe violationemotional state [7].

The key elements of such displays include:

- Knee compression at dense spacing ankles up to 5 cm or more;
- with X-shaped legs there is a marked kink the joints;
- toes and heel pointing up, and the stack axis substantially curved;
- deformed foot negatively affect the child's condition: sore legs when walking, swelling appear in the second half of the day.

When the pain in the legs, rapid wear of the shoe should be carefully examine the feet of the child and to check whether he ploskovalgusnoy strain symptoms. At the slightest suspicion of problems with joints and muscles need to go to the doctor - orthopedist.

Correct flat valgus foot help corrective shoe models, stated on the drawings.

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Figure 3 - Correction parts for deformation of the big toe

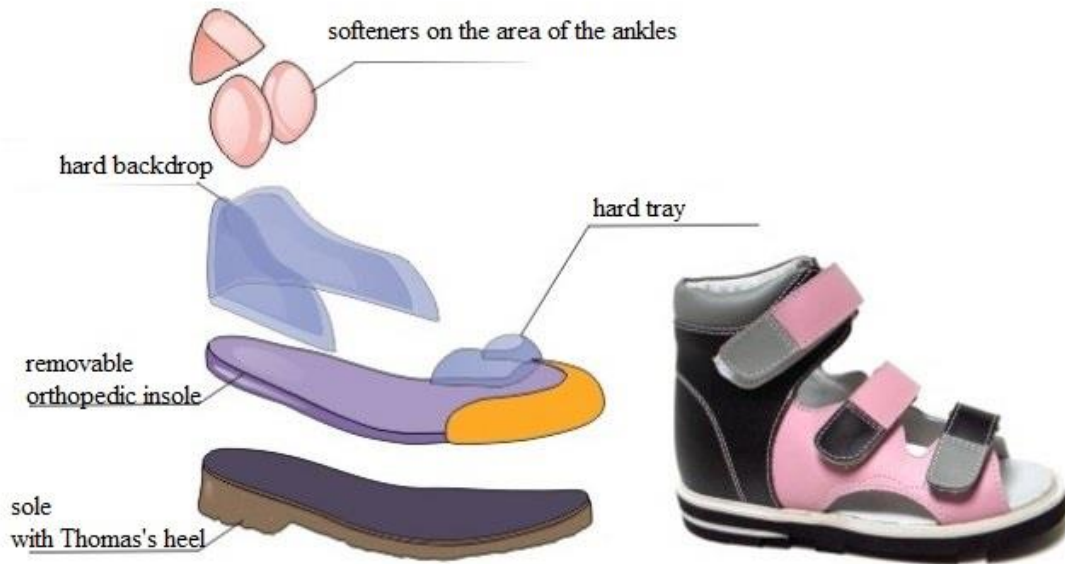


Figure 4 - Characteristics of corrective components for children with varus and valgus deformities of feet

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Figure 5 - Types of corrective components for children with abnormalities

Another common disease in children is ploskovarusnaya feet deformity. When ploskovarusnoy strain at which characteristic codes of curvature and the stop axis we are talking about

clubfoot. But the difference between these diseases is still there. The figure mentioned characteristics of the foot heel installation

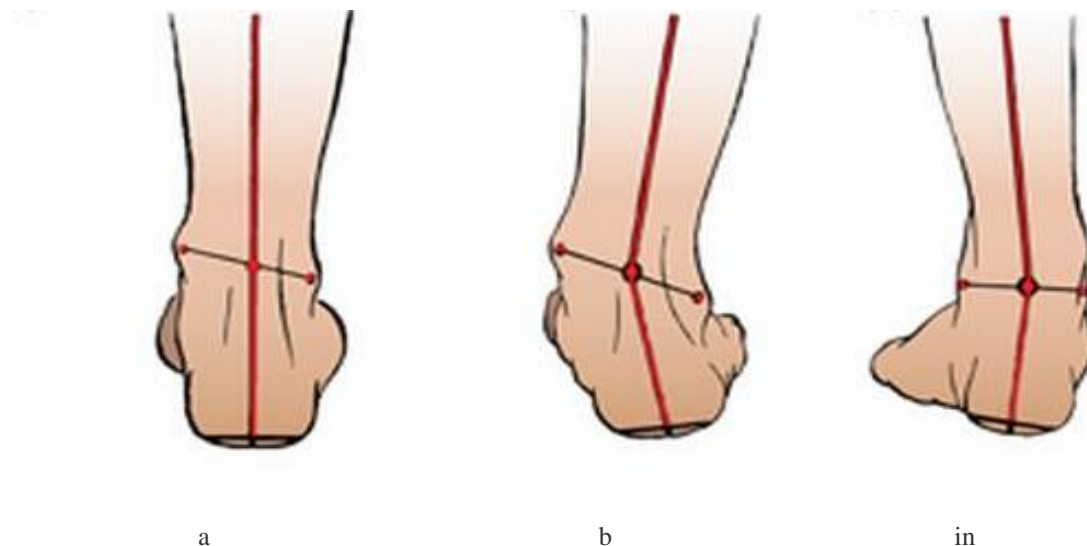


Figure 6 - the characteristic setting foot heel and) proper installation b) in the heel valgus) heel varus

Antivalgusnaya shoes - this is special footwear for children with valgus deformity of the foot.

Parents do not have to worry about that special shoes will spoil the appearance of the child: corrective sandals, shoes, boots outwardly no different from the traditional models. Fashion models for a long time to

come, made only 20 years ago, replaced by ugly antivalgusnoy shoes. (picture)

Antivalgus securely locks the ankle and astragalocalcanean joint at the foot ploskovalgusnyh changes.

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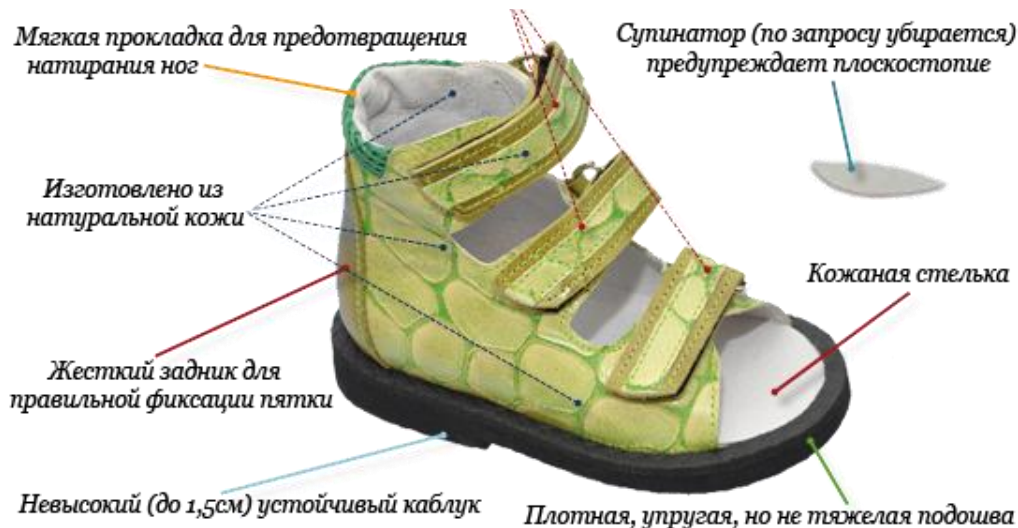


Figure 7 - Corrective anti hallux orthopedic shoes

The special design of the shoe is provided protivovalgusnoy:

- adjusted mobility bone joints, stopping the deformation;
- corrective shoes are high ankle boots, allowing the ankle to fix firmly;
- need insoles in orthopedic footwear, so all models have a removable insole that ensures correct laying open of the longitudinal arch of the foot of a child;
- in severe pathologies in special laboratories manufactured insole, arch support;
- parts for orthopedic products is made to order.

Instep - special protrusion, the production of which generates master convexity given anatomical features of the legs of the child.

Thomas orthopedic heel ensures correct installation and helps to prevent eversion of the foot inside. In the manufacture of the heel are made longer on the inner side [8].

The most common disorders associated with cerebral palsy lower limbs are flat, hollow foot, hallux varus and foot deformities, paresis of the foot, a shortening of the lower limb, different deformation fingers. This requires the inclusion in the design of certain add-ons shoes. Shoes for children with cerebral palsy should be made of high quality materials. Distinguishing features include a specially designed shoes that have a wide forefoot to provide a

natural position of the toes and the foot of the child is not deformed and took a comfortable position. The shoe sole is recommended to use with sufficient resilience and flexibility. Some models have a preventive outsole with a special heel having an elongated krukul to support and unloading of the foot. This heel, extended from the inner side of the sole. This strengthens the sole under the middle part of the foot and prevents it from heaping up inside. Using the heel helps in the prevention and treatment of foot defects. Orthopedic patients with droops software stack defined active mobility in the ankle and foot by the presence of lateral deviation. In cases where the dorsiflexion in the ankle kept and no lateral deviations of the foot, is assigned to shoes, combined with cuff and rubber rods. If the non-fixed sagging and there is very little lateral deviations of the foot, it is recommended to use orthopedic shoes in combination with the rubber cuff and rods, as well as shoes with double lacing. Expressed lateral deviations droops feet require destination orthopedic shoe with rigid sided bertsami and removal of the heel, and mezhstelechny layer must be supplemented pronator or instep. For fixed sagging or excessive mobility in the ankle boots are recommended with bilateral or circular rigid Burpee. Circular hard Berecz along with more reliable fixation creates some front stop required for rolling. The species range of products is limited. Constructs recommended for children with CP D are high boots and sandals. The height of the shoe is designed based on the doctor's prescriptions and are presented in Table. 3.2 in accordance with the GOST P 54407-2011.

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Table 1 Calculation of parameters of individual orthopedic footwear manufacturing

Sex and age group footwear	The height of the shoe, mm, not less than
	boot
For toddlers	0.3 / + 53
small children	0.3 / + 59
Preschool	0.3 / + 63
For school-girls	0.45 / + 50
For school-boys	0.4 / + 55
Maiden	0.3 / + 45
boys'	0.3 / + 45

Practice has shown that the average height of the shoe is overestimated by 50 mm from the outer ankle bone. The height of the heel portion elation - 20 mm. For children's shoes, this is the height of the heel optimalnoy. Zhestkie demands are made to form the toe of the shoe. The shape of the toe to be anatomically correct, as much as possible conform to the shape of the foot of the child. It should not deform and squeeze the toes. For the convenience of putting on

shoes ankle boots, as a rule, designed shorter, which provides the maximum degree of opening of the

shoe. Laces are the most effective method for fixing because the data structures shoe important maximum fixing child's foot in the shoe and its adjustment according to the individual parameters of the foot. An important role in the shoe for children with valgus and varus deformities stop playing Comfortable anatomical footbed.

Suitable methods for fixing the shoe on the foot are shown in Fig. 3.3.



Fig. 8 - Models of shoes for children with valgus and varus deformity of the feet: and - with laces; 6 - with buckles; in - with a fastener "Velcro"

Mandatory element layout supplementary insole is set to maintain the arch of the foot. Furthermore, based on the doctor's prescriptions for the bottom parts designed instep or pronator finger or heel of foot. Construction spacers in consideration shoe also has its own characteristics. This necessarily high Berecz hard, hard backdrop with elongated wings. When designing the shoes are used in two basic designs: shoes with vamp their configuration and their configuration bertsami. The front line of vamp shifted toward the toe for a more complete "disclosure" of the

tongue, which is important when putting on and removing the shoe and its fixation on the foot. Awesome hard Berecz made from rigid leather or plastic. Its purpose - to secure the foot and ankle. Therefore, it can be strengthened. One of the most common designs, as studies have shown, are shoes with their configuration bertsami sporty style with a short vamp. The material used for padding can be used textiles, natural leather Lining, villous, or fur, depending on the season. The list of materials is shown in Table. 2.

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Table 2. List of materials used to make orthopedic shoes for children with varus and valgus deformities stop

parts Names	Materials and designation of normative and technical documents
External parts top	Leather shoe uppers GOST 939, GOST 3717, GOST 1838 GOST 9705, skin elasticity; footwear and drape cloth in accordance with GOST 28000, cloth shoe
The internal components of the top	Leather for shoe lining in accordance with GOST 940, GOST 1838 for lining cloth of footwear according to GOST 19198, GOST 28000, GOST 29298 and technical documents, knitted fabrics for technical documents
Spacers top. Mezhpodkladka	Fabrics for mezhpodkladki GOST 19196, GOST 29298, cotton cloth with hot-melt coating mezhpodkladki
toe	Leather according to GOST 29227, GOST 1903 nitroiskozha T-shoe according to GOST 7065, elastic and thermoplastic materials for the toe cap - for technical documents
backdrop	Leather according to GOST 29277, GOST 1903 cardboard according to GOST 9542, nitro roiskozha T-shoe according to GOST 7065, the thermoplastic material for the backdrop - technical documents
The outer bottom parts. Sole	Leather shoe bottom according to GOST 29277, GOST 1903 Rubber porous plate according to GOST 12632, porous rubber plate lightened
rigid piece	Leather for shoe bottom according to GOST 1903 GOST 29277, leather saddlery GOST 1904 (on the bill back)
soft part	Skin according to GOST 939, GOST 940, GOST syromyat 1562 Russia leather saddlery in accordance with GOST 1904
metal part	65G Steel grade according to GOST 14959, I2X1BH10T grade steel according to GOST 5632, 40 steel grade according to GOST 1050, aluminum GOST 21631
Accessories. Attaching the shoe on the foot	Eyelets, hooks, rivets, eyelets, buckles, clasps, frames, metal, shoe laces, buckles, textile, shoe elastic belt - Technical Documents
Insole molded (at mezhstechny layer)	Skin according to GOST 29227, GOST 1903 GOST 1838 GOST 939, Russia leather saddlery in accordance with GOST 1904 for the lining leather shoe according to GOST 1904 for the lining leather shoe according to GOST 940

In the design of the top parts should highlight the following features: the angle between the upper edge of the tibia and the ankle line of inflection should be close to 90 ° for greatest distance beneath the laces, the expense of which is largely provided by the fixation foot. By increasing the requirements for the degree of fixation on the foot in the footwear construction may be made a combined method of fastening the shoe. It should take into account the allowances for spacers. The thickness of the spacers may reach 2-3 mm, thus to specify the volume recommended to add stop 0.5-1 cm. All this considerably affects the quality of operation of the shoe. The design can rub his leg in the tibia due to the stiffness of parts, so the presence of a small soft edge is recommended. It is not recommended to design the soft edging is too large, since it can reduce the degree of fixation on the foot. Development of designs based on consideration of the requirements ensure high quality of the relationship between consumer preferences and medical restrictions. Comfortable models have the so-called orthopedic heel of Thomas, which extended from the inside of the foot for support

in the middle section and prevent zavalivaniya foot inside. The molded outsole with a heel Thomas [9].

Outsole with a heel Thomas

An important role in the shoe for children with cerebral palsy disease play a properly fitted shoe design. Footwear must meet the requirements of GOST and have specific structural elements specific to these models. For orthopedic footwear characterized by extreme parts shapes and sizes. Distinguish special parts: soft, hard and metallic, as well as mezhstechnye layers. The special soft parts include extra laces, broaching belt side inner belt traction cuff. The special rigid parts include: heel, toe, vamp, polusoyuzka, flank, tongue flap, ankle boots, curly top insole. These parts are additionally fixed shoes and increase its dimensional stability. Hard heel - an intermediate or outer piece orthopedic shoe upper, an calcaneo- gelenochnoy portion.

hard backdrop

Along the length of the wing are distinguished with the extension of the hard heel gelenok through either extension to the fifth finger, depending on the destination of the doctor - orthopedist.

Renewals hard backdrop, structural elements

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Hard Berez side portion increases the strength and often used in orthopedic shoes.

Unilateral hard Berez - detail located in pyatoch- but gelenochnoy-part orthopedic shoe.

Bilateral hard Berez - internal or intermediate piece is located in the heel-part gelenochnoy orthopedic shoe. Detail has protrusions on the side surfaces above the ankle bertsami restricting the mobility of the subtalar joint.

Bilateral hard Berez

Circular corset - detail orthopedic shoes covering the back, side and rear of the foot and lower leg above the ankle, which limits the mobility in the ankle joint.

By mezhstelechnym layers include: laying open the vaults, Kosok, reverse Kosok, cork, pronator and supinator. Mezhstelechnye layers - a top inner parts orthopedic shoe for redistribution of load along the plantar surface of the foot. They are located between the figural and the insole.

Realize vaultsand it has a minimum thickness necessary to align the relief calcaneo- gelenochnoy track portion orthopedic pads. It serves to maintain the longitudinal arch of the foot. Insole with computation arch (in block form).

laying out a set of

Kosoklocated in calcaneo- gelenochnoy portion has a certain thickness in the heel portion, which comes to naught in the beam parts. Kosok looks like a wedge and serves to compensate for the shortening of the leg. Koski are steep or sloping in one direction or another (outer, inner, forward or backward).

Bunglocated under the entire plantar surface of the foot. The thickness of the beam tube and heel portions is the same. Wedge-shaped plug to compensate for the shortening of the lower limbs in children are not used to prevent abnormal setting foot in equinus position vicious.

Bung

pronator - insole part that lifts the outer edge of the foot. Pronator with computation arch (view from the insole pad surface).

pronator

supinator - insole detail that raises the inside edge of the foot.

metatarsal arch support

Distinguish pronator or supinator for the entire track, the front or rear card mezhstelechnogo layer. Design shoes vary in purpose and operational sex and age group and possible accompanying deformation. Therefore, the design has its own characteristics [10].

Types of orthopedic footwear

2.1 Antivalgusnaya shoes

2.2 Antivarusnye model

2.3 Stabilizing orthopedic shoes

With severe foot deformities appointed complex orthopedic shoes for children, which is mainly made to order. I found its use in footwear and rehabilitation programs for disabled children, including varus and valgus deformities of feet (see Figure 9).



Figure 9 - a complex type shoes for children with disabilities with varus and valgus deformity stop.

The main purposes for which the appointed orthopedic shoes for children with varus and valgus foot deformities include:

- position correction of the ankle and foot and maintaining it while walking;
- correct load redistribution to certain parts of the foot on all foot;
- compensation of anomalies, such as shortening of the legs;
- improved support and facilitate movement.

The main difference is the presence of footwear special shoes designed for the particular strain. Orthopedic shoes for children with cerebral palsy should possess the following characteristics:

- the presence of a high backdrop - it is necessary to secure the ankle, so should be the optimal degree of hardness;
- high availability and rigid Berz used to prevent zavalivaniya foot when walking;
- must be low heels and removable insoles - Update must be supplemented by special items.

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Also, shoes should be comfortable to put on and removed, so it is a good detection rate is also an

important factor. Types of orthopedic footwear for children with varus and valgus deformity stop.



Figure 10 - Orthopedic footwear for children with varus and valgus deformity stop

As a rule, complex orthopedic shoes for children with cerebral palsy is classified into three large groups. The division is based on the type and complexity of footwear disease for which it is intended. Thus isolated [11]:

Antivalgusnaya shoes

The main purpose of its application is X-shaped production stop due to the fact that the ligaments of the foot can not stand a child's body. This may be the result of excess body weight or weak muscle tone arch of the foot. The inner edge of the foot with the slack, and discharged to the outside front. Antivalgusnaya shoes is characterized by:

- bilateral tibia high rigid type providing stabilization ankle in a vertical position;
- an elongated inner tibia, holding the heel of zavalivanija;

- instep with longitudinal tabs needed to support the arch of the foot.

Antivarusnye model

Designed for deformity correction, in which the joints of the knees are bent to the side. As a result, the child has to rely on external arches of the foot when walking. This diagnosis implies a shoe with a rigid fixation of the hindfoot while diverting the front. Such footwear should be equipped with:

- high backdrop to a third ankle in the lower part thereof;
- tough backdrop, from the inside to the extended fingers;
- insole - pronator.

Stabilizing orthopedic shoes

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Figure 11 - Footwear equine-vargusnoy and equine-varus foot abnormalities

It is used in equine-vargusnoy and equine-varus foot abnormalities characteristic of cerebral palsy. Footwear develops movement skills, forming the correct gait and preventing further deformation. Distinctive features of the model are:

- high heel mid-calf;
- Berez sided rigid type;
- insole, arch support;
- the locking element at the bottom.

Therapeutic and prophylactic, maloslozhnaya orthopedic footwear performs diagnostic, preventive and curative functions. In the process of wearing such shoes can independently verify the presence or absence of defects of the feet of the child by examining which areas subjected to abrasion on the sole. In the case of the proper development of the child's feet these shoes can be worn as a preventive for the proper formation of the joints of children's feet. In the case of detection of any deformation of the foot prevention shoes it is recommended to wear at all times with the use of orthopedic insoles. The main task of this shoe is to prevent pathologies and correct formation of the arch. The most important advantage of this shoe is the presence of glued at the factory of orthopedic insoles -supinatora, the purpose of which - the prevention of flat feet and the relief of pain when walking [12].

Only natural high-quality materials used in the manufacture of footwear: leather and nubuck, allowing the foot to "breathe". The models are characterized by having a high hard backdrop. The design of the fasteners allows to fix the child's foot in the correct position. There is an optimal heel, flexible non-slip sole. With this shoe provides the proper development of the baby's legs both as a prophylactic shoe, and as a therapeutic shoe. Specialists (orthopedists, pediatricians, neurologists) note the practicality and comfort of this shoe, its compliance with modern requirements that apply to children's shoes. Caring parents bought a beautiful, expensive shoes, which, unfortunately, in the best case, the child does not fit, and often harms the child's legs.

Additionally affects hard surface (asphalt, concrete, linoleum, laminate) that surrounds the baby in the city. Children with "problem" legs can not wear normal shoes factory production, even the one on which the manufacturer shall be marked «ortopedic». To solve this problem, the design of children's footwear developed for the prevention of a plano-valgus deformity. for baby shoes with flat-valgus feet should have a hard heel, well fixing the ankle using laces, straps or "sticky." Developed sketches of models of shoes for flat-valgus deformity of the foot (Figure).

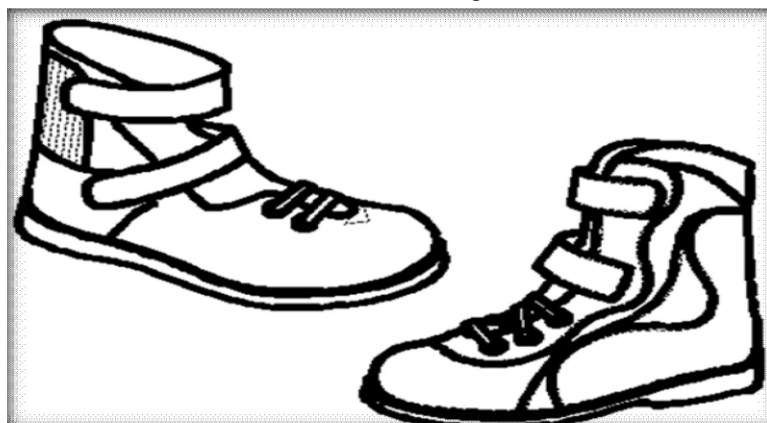


Figure 12 - Thumbnails models shoes for flat-valgus deformity of the foot

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For fixing the ankle proposed construction of the shoe heel, in which a certain rigidity created by the process parameters, namely, the heel portion uses an additional assembly of the outer member, the intermediate member and the pad (Figure 13). The

intermediate member of the batt which sew the workpiece upper parallel lines at a certain distance (Fig. 13). This creates the necessary rigidity of the heel part. [14]

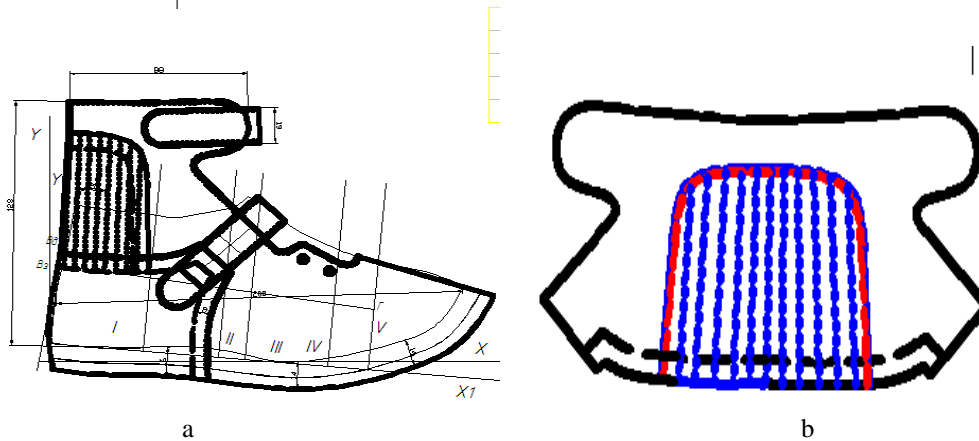


Figure 13 Design of details of top children's footwear prevention of foot flat-valgus a) Grund model uppers for the prophylaxis and b) the top node in the shoe heel portion

The developed designs uppers mated with anatomical arch support will provide the most effective exercise arch support and the correction angle of the inclination. This ensures proper development of the articular surfaces and further strain development is eliminated. SUMMARY developed by us supplementary insole structure is that it has a second intermediate layer, which is a flexible surface coated silica beads located above the elastic layer-prostilkoy throughout the insole surface. Removable insoles represents a multilayer structure in Figure 3, consisting of an upper layer 1 -2 additional intermediate layer of a flexible material, the surface of which is coated, of silica gel beads of different diameters in various sections, arranged over the intermediate layer of the elastic layer 3 -prostilki across supplementary insole surface and the lower layer 4. Rationale for the design of shoe uppers in accordance with the direction and the fashion footwear intended purpose. In the sketches of

children's shoes for the prevention of a plano-valgus foot developed a model based on a single imaginative solutions, style and material properties. In the first stage we are invited to develop 4-5 models of a product in order to choose the optimum structural and color scheme of the basic model, in their design must take into account the construction of pads, the shape of the toe. The final decision on the choice of the base model was adopted after consultation (Table). At the same time carry out a comparative assessment models for manufacturability, unification, technical aesthetics. In developing designs leather products should be approached with the basic positions [15]:

- functional predetermines supplies;
- constructive (design-technological), reflecting efficient and economical use of the material);
- aesthetic. Pads Index 311 251 180 Size,

TABLE 3. Characteristics pads

Name Classification sign	setting value classification attribute
1. Sex and age group of pads	nursery
2. Subgroup pads (height of elation heel part)	10mm
3. The numbering system	metric
4. The initial number pad	180

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5. Completeness pads	4
6. pads type	For closed shoes
7. design pads	Articulated
8. Non blocks in the series	175-200
9. The number of required completeness, numbers fulness	3
10. The interval between adjacent Completeness circumference, mm	6
11. Blocks Index	311251

On the basis of the selected model developed preliminary list, where, along with the base model placed 4-5 models, which differ from the base by additional or modified components or accessories, construction fasteners, soles, heels, etc. In this case, the basic details have not changed since when cutting is necessary to keep the same cutter. Allowed to change one or two details. In the text it is necessary to refer to the number assigned to a number of standardized models, indicating these numbers. Give a detailed description of all models of the unified series and their designs, distinctive features in the figures should reflect the type of materials used. It creates a unified series based on a single base shoe; for leather goods - two unified series. When choosing materials on the top and bottom parts of shoes should proceed from the kind and type of shoe, its purpose are the requirements to details, the fashion trends. All parts uppers (one pair) is generally used material of one kind only sometimes combine two types of material. When using a skin difference in requirements details uppers considered selection of its thickness, density and ductility. Thus, the most critical parts (vamp) Cheprak cut out from the skin, and a secondary part (tongue) - pripolnyhuchastov of which are more malleable and have a smaller thickness. Vamp toe part is the foremost part of the shoe, so the material for this part make high aesthetic requirements: it must be resistant to cracking, abrasion, contamination, its surface should be easily cleaned from contaminants. The materials for the uppers impose more stringent than for other items, technology and consumers' requirements, as vamp operates in more complex field of force as in the manufacture of footwear, and in its operation. It is in this zone the largest preform extractor shoe upper

during molding and maximum flexing when worn [16]. From the viewpoint of hygiene material for shoe upper should provide normal microclimate vnutriobuvnogo space, t. E. Be waterproof the front side, a heat-resistant, have a low thermal conductivity, be permeable, hygroscopic, resistant to perspiration action, have high rates of water absorption and vlagootdachi . The material for shoe uppers, must not allocate or release in the minimal amount of a substance that can cause diseases of the skin and other organs of the foot. According to GOST 26165-04 "SHOES CHILDREN" on top of the outer parts can be applied on chrome-tanned leather GOST 939-88. Shoe uppers are divided into two main groups: leather uppers and linings preferably lame tanning method for everyday shoes. A special subgroup of suede - leather fat and fat-formaldehyde tanning; Leather for shoe uppers and linings are divided by type of raw material from which they have been made, the configuration and the method of tanning method and character decoration. Furthermore skin divided area, thickness, and depending on the quality grade. Government standards provide the following types of finishing the front surface of the leather: smooth skin with natural unground with podshlifovannoy and polished front surface; leather with an embossed front surface; skin with a threaded outer surface; patent leather and "crumpled" skin. Skin produce the following types of coating the front surface; casein, casein-emulsion, the emulsion, nitroemulsionnoe. According to type of the type of raw chrome leather divided into calf, vyrostok, polukochnik, Rawhide, Rawhide, Bychin etc. Comparison of key physical and mechanical characteristics of the three views materials given in Table 4 [17].

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Table 4 Comparison of Indicators of materials for physical and mechanical properties

number p / p	Name indicators	U measure	Value indicators GOST or TU		
			Chromium. Rawhide	Chromium. polukozh	Chromium. vyrostok
1	2	3	4	5	6
1.	Tensile strength at stretching (Mean of the longitudinal and transverse specimens)	Kgf / mm ²	21/18	21/19	26 / 23.5
2.	Elongation at a load 1kgs / mm ²	%	18-30	18-30	15-25
3.	Voltage at appearance cracks facing layer (average value)	Kgf / mm ²	17	18.5	21-15
4.	stability coverage to flexing	bend Men do not	1500	1500	1500
5.	The thickness of the skin in the standard point	mm	0.9-1.2	0.9-1.2	0.8-1.1
6.	Content matter leachable organic solvents	%	3,8-8,8	3,8-8,8	3,8-8,8
7.	The content of chromium oxide	%	4.3	4.3	4.3
8.	The moisture content of not less than	%	10-16	10-16	10-16
9.	The average area of the skin	dm ²	240	195	75
10.	Namokaemost	%	18	16	16
eleven.	breathability	cm ³ /from	60-80	60-80	50-75
12.	water vapor permeability	%	49	40-65	40-65
thirteen.	The average weight of the skins	kg	21	eleven	6.5

Based on data in Table. it can be concluded that the choice of the outer parts chrome top rawhide cost of the set-top shoes will be the smallest that has a significant impact on the cost of the shoe as a whole. But for aesthetic reasons at the top of the outer parts chrome vyrostok selected. When choosing materials recommended wider use of new materials that replace natural skin, guided by the requirements of GOST or TP for finished products.

Description of the appearance of the product

1. Shine Profession: preschool

2. Type of footwear: boots
3. Style pads: 311 212.....
4. The method of fixing: adhesive
5. Upper Material: chrome leather vyrostok
6. The bottom Material: porous rubber
7. guests at the Footwear: GOST 26165-04 "Children footwear"
8. The preform Structure: gated shoes with b / t velcro strap, leather edging zadinkoy and details zadinki. As used decoration combining tsvetovoygammy

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Figure 13. Children's shoes for the prevention of flat-valgus feet

TABLE 5. Model passport

number	Name parts	Number on pair	Name material	Thickness parts	Standard on material
1	2	3	4	5	6
1	vamp	2	Chromic vyrostok	1.1-1.3	939-88
2	Berecz	2	cloth jeans	1.1-1.3	19196-84
3	backdrop	4	cloth jeans	1.1-1.3	19196-84
4	The upper part backs	2	Chromic vyrostok	1.1-1.2	939-88
5	CHPR	2	Chromic vyrostok	1.1-1.2	939-88
6	detail CHPR	2	Chromic vyrostok	1.1-1.2	939-88
7	detail backs	2	Chromic vyrostok	1,9-1,0	939-88
8	lining under vamp	2	lining leather sheepskin	0.9-1.1	940-81
9	lining under Berecz	2	lining leather sheepskin	0.9-1.1	940-81
10	lining under CHPR	2	lining leather sheepskin	0.9-1.1	940-81
eleven	shock absorber backs	2	foam rubber	10	NTD
12	Mezhpodkladka under vamp	2	Termobaz	+	TU

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thirteen	Mezhpodkladka under tailpiece	4	Termobaz	+	TU
14	toe	2	Thermoplastic material for the the toe cap	1.1-1.5	TU 17 21-597-83
fifteen	backdrop	2	Thermoplastic	+	TU 17 24-84
16	removable insoles preventive	2	lining leather sheepskin waste + PU	+1.8	19196-84
17	Soft heel cushions	2	foam rubber	+	BAT
18	insole	2	Kozhkarton	2.3-2.4	9245-84
19	Postilka	2	Batting	+	BAT
20	Heel	2	Moss rubber	20	12365-84
21	Sole	2	Moss rubber	8-10	12365-84

Description of the appearance of the product

1. Shine Profession: preschool
2. Type of footwear: boots
3. Style pads: 311 212.....
4. The method of fixing: adhesive
5. Upper Material: chrome leather vyrostok
6. The bottom Material: PVC

7. guests at the Footwear: GOST 26165-04 "Children footwear"

8. The preform design: Open-type boots composed of vamp parts vamp, tibia, ZNR, soft edge bertsevi, b / t of the belt on the buckle, as the decoration applied combination of colors, decorative seams and perforations on the vamp



Figure 14 - Children's shoes for the prevention of flat-valgus feet with leather backdrop

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TABLE 6. Model passport

number	Name parts	quantitative in Napara	Name material	Thickness parts	Standard on material
1	vamp	2	chrome vyrostok	1.1-1.3	939-88
2	detail vamp	2	cloth jeans	1.1-1.3	19196-84
3	Berecz	4	cloth jeans	1.1-1.3	19196-84
4	The upper part tibia	2	chrome vyrostok	1.1-1.2	939-88
5	CHPR	2	chrome vyrostok	1.1-1.2	939-88
6	ZNR	2	chrome vyrostok	1.1-1.2	939-88
7	detail backs	2	chrome vyrostok	1,9-1,0	939-88
8	lining under vamp	2	lining leather sheepskin	0.9-1.1	940-81
9	lining under Berecz	2	lining leather sheepskin	0.9-1.1	940-81
10	lining under CHPR	2	lining leather sheepskin	0.9-1.1	940-81
eleven	shock absorber backs	2	foam rubber	10	NTD
14	toe	2	thermoplastic material for the toe cap	1.1-1.5	TU 17 21-597- 83
fifteen	backdrop	2	Thermoplastic	+	TU 17 24-84
16	removable insoles preventive	2	lining leather sheepskin + PU waste	+1.8	19196-84
17	Soft heel cushions	2	foam rubber	+	BAT
18	insole	2	Kozhkarton	2.3-2.4	9245-84
19	Postilka	2	Batting	+	BAT
20	Sole	2	Rubber	8-10	12365-84

Conclusion

Based on research to determine consumer preferences found that the currently implemented baby shoes with prophylactic properties has some drawbacks regarding both materials and design, and external signs. Consumers experience an obvious flaw in the children's prophylactic footwear domestic

production. Based on analysis of the design features prophylactic shoes installed main structural features of the shoe to the foot resheniyavoprosta dense fixation of the child and to provide the necessary stiffness heel part of the shoe upper structure designed fixing the ankle joint using laces, straps or "Velcro". For fixing the ankle proposed design heel of the shoe, in which a certain rigidity created by the process parameters,

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namely, the heel portion uses an additional assembly of the outer member, the intermediate member and the lining, developed constructions uppers mated with anatomical arch support provides implement maximum effective support for the arch stopyi correction angle of inclination [18-19].

It is shown that anthropometric study and stop the development of science-based requirements for the design of footwear for children and teenagers is a topical issue for the footwear industry. It was determined that the main factor in the formation of the requirements for shoes for children's shoes should be the preservation of health, as this age is vulnerable to environmental action. The place of the shoe in combination of health factors. It was found that the shoe has an impact on all categories of health: somatic, personal and social. Thus, the use of standard mass produced shoe means orthopedic technology as supplementary insoles and other supplementary devices can serve as an effective means to improve its preventive properties including for flat - valgus foot. To do this, specialists in the design and manufacture of footwear of mass production should timely receive current information about the new designs of these orthopedic appliances, as well as the indications for their use.

Parents of children with abnormalities, including with flat feet, experiencing an obvious flaw in the

children's prophylactic footwear domestic production. established its basic design features based on analyzing preventive footwear. Shoes with prophylactic properties of a certain segment of the consumer market of Child and Adolescent shoes. It is distinguished by the presence of design solutions, providing maximum comfort to wear, the presence of special parts (ins anatomical insoles, polustelki, calculations and other flavoring components), a rational evidence-based internal form of footwear and application of high-tech materials in the manufacture of shoes, their tough selection for physical and mechanical and hygienic parameters. On preventive footwear experimenting with new designs and materials to ensure maximum comfort to the child, and the creation of necessary conditions for it to prevent disease and foot deformities.

The developed designs uppers with anatomical arch support provide the most effective support arch and correction of the angle of her naklona. Takim, it is important to have a permanent union between a doctor - orthopedist and manufacturers corrective detalny to garanitrovat stop child comfort and high confidence to him and his parents on the prevention education at their child patolgicheskikh deviations.

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