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SOI: [1.1/TAS](#) DOI: [10.15863/TAS](#)

International Scientific Journal Theoretical & Applied Science

p-ISSN: 2308-4944 (print) e-ISSN: 2409-0085 (online)

Year: 2020 Issue: 09 Volume: 89

Published: 07.09.2020 <http://T-Science.org>

QR – Issue



QR – Article



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POSSIBILITIES OF PREVENTIVE MEASURES AND CORRECTIVE MEASURES TO REDUCE PATHOLOGICAL FOOT ABNORMALITIES IN CHILDREN (MESSAGE 5)

Abstract: in the article, the authors consider the need to restore production in the range of shoes for children, including orthopedic, whose feet have pathological abnormalities taking into account anthropometric features. The authors have developed recommendations for the orthopedist and manufacturers of orthopedic shoes on its correct selection, taking into account pathological abnormalities, to ensure that the child has a healthy foot, eliminating 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: footwear assortment, pathological deviations, anthropometry, demand, realization, competitiveness, demand, financial stability, plantography, rengenography, plaster casts, prosthetics, rehabilitation
The beginning of the first part.

Language: English

Citation: Blagorodov, A. A., Bordukh, D. O., & Prokhorov, V. T. (2020). Possibilities of preventive measures and corrective measures to reduce pathological foot abnormalities in children (message 5). *ISJ Theoretical & Applied Science*, 09 (89), 101-152.

Soi: <http://s-o-i.org/1.1/TAS-09-89-18> **Doi:**  <https://dx.doi.org/10.15863/TAS.2020.09.89.18>
Scopus ASCC: 2700.

Introduction

UDC 685: 74 519.54.

The design of preventive footwear designed to prevent abnormalities of the foot, especially the static deformation. It is available on the pads for the mass manufacturing of shoes average (fourth -Six) completeness or blocks increased fullness. Preventive elements of the shoe are insoles polustelki, calculations of the longitudinal and transverse arches.

The design of orthopedic shoes tailored to the abnormalities of the foot, lower leg or thigh.

When orthopedic disorders complicated (it is primarily the degree of heavy dynamic deficiency diseases) special shoes assigned only after the maximum possible deformity correction by modern orthopedic surgery. In diseases with static lung failure and some forms of dynamic deficiency disorders - contrary to surgery is resorted to only in extreme cases where the conservative treatment in conjunction with an orthopedic shoe is inefficient.

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Orthopedic footwear serves the following purposes:

- Make sure the support, ie, facilitate walking and standing at more or less the defect stack if the deformation can not be removed surgically or if the patient refuses operation;

- corrected initial, unstable deformation of the stop;

- notify the progression or recurrence of deformation;

- to increase the area of support feet;
- compensate for the shortening of the limbs;
- to support the arch of the foot, to relieve painful areas;

- facilitate walking in orthopedic devices;
- mask cosmetic defect, and others.

Orthopedic footwear is made of all types and designs and may have low (0-29 mm) or medium (30-49 mm) heels.

Depending on the degree of severity of the strain of foot orthopedic shoes is divided into maloslozhnuyu and complex.

Maloslozhnaya orthopedic shoes designed for people with moderately pronounced deformation of the lower extremities. Shoes produced increased fullness (up to 13th) for a special orthopedic pads.

It is also possible serial production of such shoes. In this case, under the maloslozhnoy orthopedic shoes is to be understood such, the internal shape of which is standardized and designed to meet the anatomic changes of lower limb pathologies, for which it is designed. Thus individual approach to treatment is provided by varying the supplementary profile orthopedic insole, whose parameters are taken into account when designing the inner shoe shape. Thus, loose profiled orthopedic insole is not a separate supplementary device, and developed a special detail maloslozhnoy orthopedic shoes.

In most cases, orthopedic footwear maloslozhnaya appointed:

- in functional insufficiency (relatively rare);
- static deformations moderate;
- diseases on the background of functional impairment and static deformation;
- relative limb shortening up to 30 mm;
- hollow foot.

Construction maloslozhnoy orthopedic shoes, appointed in functional insufficiency stop distinguished by the presence of household:

- special parts (loose attachments);
- vnutriobuvnogo additional space for insertion of these devices.

Shoes can be made of all kinds, heel height - low or medium.

Sophisticated orthopedic footwear designed for individuals who have expressed strain and foot defects. It refers to a complex footwear, having at least two special parts or orthopedic Kosok to compensate for shortening of 30 mm or more. This shoe is

available both in standard blocks, and on plaster casts. Footwear includes special parts, correcting the position of the foot: rigid vamp, ankle boots, laying open vault, pronator, oblique or elongated heels, etc.

Complex orthopedic shoes can be divided into two major groups:

- corrective shoes, the purpose of which is more amenable to correction corrective deformations, such as paralytic clubfoot, etc .;

- footwear, the purpose of which is to compensate for various incurable deformations uncorrectable surgically, such as stumps foot, various shortening etc. Complicated orthopedic footwear characterized by the special design of the top and bottom. Its production is almost always done individually.

Main part

Children's orthopedic shoes - one of the tools of the conservative treatment of pathologies of the musculoskeletal system, which plays an important role in the child's recovery. The main task of the children's orthopedic shoes is to form the correct installation of the physiological and arches of the foot, disease prevention is not only the foot, but the entire musculoskeletal system.

However, these requirements are added also the aesthetic characteristics of the product. Appearance of the product, as well as functional movement correction, provide the desired medical effect.

One of the first characteristics of the surrounding world, which accept children - the color. Color - is the bright side of childhood. Kids love to color, react to it. Color contributes to their development and has a very strong impact on the child. Knowing its strengths and weaknesses, you can control the emotional state of the child and his mood.

Color impression that children get from the surrounding life must be organized, given to the system. This should be done in all areas of life.

Important for medicine is the fact that the foundations of the sensory perception of color laid down in the physiological nature of the person and are able to develop from childhood. According to modern psychological and pedagogical research, the child has a great potential in the field of color perception. Already in the early stages of development, the child needs a favorable visual impression and observations of objects.

In the analysis of preferences should be defined especially tsve- tovospriyatiya for children of different age groups.

In justifying his choice of color children do not rely on the subject of color associations, and are based on the impression produced on them one way or another color stimulus. Bright colors attract and delight them, look for the child to be color. Usually, experienced designers of children's shoes tend to use the three primary colors of the spectrum when

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choosing a design children's shoes. It's all shades of yellow, blue and red. Their children perceive better than others, especially paying attention to the shoes similar colors.

Red color for a child - a strong irritant. It usually causes children activity. If it is correct to use this, you can select the colors of children's shoes, depending on its intended use. Yellow is the color of harmony, it can cause a child feeling of joy, as well as encourage him to focus and obedience. Particularly beneficial effect on the yellow color of the excited, nervous and prone to tantrums child. Also, yellow stimulates the appetite (as a child or an adult). Pink - the color of the border. In a brilliant scheme is identical to the exciting red, and pale - read brain as blue. Green encourages interest in learning and knowledge of the world. Shades of green inspire courage child, form a self-confidence. Blue, light blue, purple - soothing colors, do any less active perception. They refer to the colors of introversion - impulses, facing inwards, focused on

the inner life closed. These colors can be used for hyperactive children, to counteract excessive stimulation.

Browns give stability and confidence, but we must be careful with them. It's more of an adult color. Emotional, and the moving child's mind brown can broadcast isolation and secrecy. Black, white, gray, color is also very adult. In child psychology, these colors are treated as extreme forms of neutral, often even as lack of color at all, and rarely cause any emotions, especially positive.

All these features of perception of color, and should be considered very selectively used in the manufacture of orthopedic shoes for children. Proper use of colors helps to improve psihoemotsonalogo condition of the child with disabilities. Color can be added decor. Examples shoe designs using applications are shown in Figure 1. It is possible to vary the color spectrum depending on the child's temperament and preferences.



Fig. 1 Forms applications in children's shoes

For example, a "mouse" gray or white can be on any background - red, blue, green. The color of the soft edge can either repeat the background color, and have applications in tone depending on the desired effect. "Owlet" can be darker or lighter background tibia, or contrast. Applications "Kitten", "bunny" is better made of a material in a contrasting color, as children are very fond of these characters, and "Cat" will look spectacular from the material a little darker than the main. Decoration items shoe upper using such applications will allow the child to form positive emotions in the treatment, accelerate the process of adaptation of the small person in society.

Questions psychological assistance to children with cerebral palsy disease covered far enough. Practical application of various psycho-techniques aimed at patients, often used by psychologists and teachers without regard to forms of the disease, the level of development of intellectual processes and features of emotional and volitional. The lack of

clearly developed differentiated methods of psychological correction of children with cerebral palsy may have a negative impact on patient quality of mental development.

The problem of the development of children with cerebral palsy, devoted a considerable amount of work [126-133]. The process of perception and color reproduction children studied by many psychologists, art historians and educators. Special psychological studies of the development of sensory-perceptual and intellectual processes with cerebral palsy in the foreign and domestic literature presented is extremely insufficient. Several authors [134-136] linked disorders cognitive processes in cerebral palsy with impaired motor skills, underlining that breaches perception of objects, visual-spatial orientation with cerebral palsy due to motor failure. The mechanism of specific abnormalities in mental development is complex and determined by the time, and the degree of localization of brain lesions.

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Currently, the special psychology and correctional pedagogy, there are different classifications of disorders in development. The most common is the classification of BP Puzanov and VA Lapshina [137] (APPENDIX I), wherein the isolated group mentally retarded children and those with mental retardation separately from children with musculoskeletal disorders. But, in the framework of work on the creation of products with high rehabilitative effect, should be considered a violation of the musculoskeletal system in conjunction with mental retardation. Among the factors influencing the psychological development of children with cerebral palsy Disease allocated organic CNS and limited movement and self-self, which occurs due to a mismatch between the formation of a satisfactory overall level of abstract logical thinking and deficiency of spatial representations. Deviations of development can also be attributed to lack of practice, socio-cultural experience and an inability to communicate with others.

In all forms of cerebral palsy are taking place deep delay and disruption of the kinesthetic analyzer (tactile and muscle-joint senses). Children find it difficult to determine the position and direction of movement of the fingers without visual control. Groping hand movements are often very weak, touch and recognition of objects on a touch difficult. Perceptual disorders in patients of children associated with the lack of kinesthetic, visual and auditory perception, as well as their joint activities. Because the perception of movement disorders also broken. Due to the difficulties of movement there are difficulties in the knowledge of the world. These children are vulnerable, impressionable, have emotional and behavioral and personality disorders. There is a strong attachment to parents or persons substituting them.

For the majority of children with cerebral palsy is characterized by mental retardation of the type of mental infantilism. At an early age, such children's activities are governed primarily an emotion of pleasure, self-centered, they are not able to work productively in a team, to relate their desires with those of others. At older ages, immaturity of the emotional and volitional can manifest itself in high suggestibility, inability to willpower over itself. This behavior is often accompanied by emotional instability, fatigue, motor disinhibition.

Thus, when considering the issues of psychological support for children with cerebral palsy to a large extent we have to pay attention to the quality of psychological diagnosis, considering the psychological support as a complex system of rehabilitation actions aimed at increasing social activity, the development of autonomy, strengthening the social position of the person, the development of intelligent processes.

Influence on mental state can be performed in various ways and methods. In the shoes of the most

significant influence is the color scheme of the product. Implementation of color solutions product associated with the analysis of the sequence of layers: color preferences and emotional impact of color. Color - qualitative subjective characteristic of electromagnetic radiation in the optical range, which is determined based on the physiological visual sensation arising and depends on a number of physiological and psychological factors. Human perception of color is determined by the individual, as well as the spectral composition, color and luminance contrast to the surrounding light sources and nonluminous objects. Thus, the color - it's a feeling that gets people in contact with him in the eyes of the light rays. The same light exposure can trigger different feelings in different people.

Studying the effect of color on the central nervous system involved many psychologists. Based on the recommendations of experts made painting walls, furniture, etc. in many institutions. According to psychologists [138, 139], color therapy is especially important for children with mental and physical development.

There are various diagnostic tests and for the study of color perception by preschool children, including "The study of color perception" Uruntaevoy GA, Afonkin YA.; "Survey Map of color children" Voylokovoy EF Andrukhovich YV, Kovalyova L.YU; "The color relations test" developed by M. Luscher [140-142].The studies found [143] that up to 2.5-3 years the child perceives only achromatic colors (black and white). From three to four it begins to perceive the color of the first chromatic axis - blue and yellow after four - recognizes the second chromatic color axis - red and green. Fully mastered all the colors of children to six years. It is noteworthy that the love of flowers, most children is replaced by exactly the chromatic circle. For thirty years the person usually does not define one of the colors as the preferred, and all the basic colors are perceived equally.

Selective chromotherapy - medical and pharmaceutical effects of monochromatic visible light. Visible light selectively affects subcortical nerve centers (midbrain, midbrain roof, rostral mounds). Visible light of different wavelengths can alter brain excitability, corrected the psycho-emotional state and improve the tone of the body.

During the absorption of the visible radiation in the skin is released heat which modifies spike activity thermo mechanosensitive leather fibers activates segmental reflector and local reactions microvasculature and enhances the metabolism of irradiated tissues.

Thus, when designing footwear to be considered, as will be perceived by a child of a given age and disease developed form design and, accordingly, it will affect his emotional state and psychophysiological development. In this case, shoes should promote the development of children's

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thinking, perception and harmony with the internal and the world around them. Thus, the development of the design of shoes for children with cerebral palsy disease must be considered not only a fashion trend, but also the nature of the disease, and mental state of the patient, controlling and regulating so emotional background rebenka. Razrabotka design of light industry products for patients with cerebral palsy disease should be carried out according with the temperament of children to compensate for the

deviation of a group of diseases. Following this, you can create a shoe that meets the visual component of therapeutic and prophylactic properties of the product. After studying the sources, dedicated to color and color therapy, we have compiled a table 1, which reflects the basic colors, their effects on the body and psyche of the child, as well as color to compensate for the negative effects of an overabundance of any color in the product.

Table 1 - Characteristics of the impact of color on the body and the psyche of the child

Color	medicinal properties		Excess	Compensation
	physical	psychological		
1	2	3	4	5
Red	It encourages all forms of energy. It helps to gather physical forces. Quickens the heartbeat. Stimulates brain activity. In brief exposure increases efficiency. improves appetite	It helps to concentrate, inspires confidence. May cause joy or aggression	causes stimulus-ness overexcited-set, fatigue, decreased attention	green
Yellow	It stimulates the brain, in the case of mental deficiency. It stimulates the mind to focus, harmony and obedience. improves appetite	uplifting, it gives confidence, energizes. Increases sociable-ness	It causes mental fatigue, headache	purple
Green	It promotes healing in medical institutions. It reduces pain. It calms the nervous system. Reduces irritability. It reduces high blood pressure, relieves migraines and neuralgia. Prolonged interaction causes a steady rise efficiency	soothing. It reduces stress. Encourages interest in the knowledge of the world and learning raises self-esteem and self-confidence. It gives courage, peaceful, meditative	causes boredom	red
Orange	It accelerates the heart rate. It improves appetite. In brief exposure increases efficiency	uplifting. It stimulates creative thinking. It creates a sense of well-being and fun, liberating feelings	It causes distraction	blue
Turquoise	stimulates the immune system, promotes relaxation of muscles	It strengthens the feeling of peace	It is stubborn and peremptory	pink

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Purple	improves physical abilities, it helps relieve headaches. A positive effect on the heart, blood vessels and lungs. Increases endurance. Reduces physical activity and performance.	Enhances intuition and empathy. It causes harmony and peace.	It causes a feeling of fear, oppression and anxiety.	yellow
Blue	lowers blood pressure, improves sleep, relieves joint pain. It is effective for neuralgic pains. It reduces appetite. Dramatically reduces the activity and emotional stress. It reduces the activity of life processes, normalizes breathing pulse	It helps in understanding new things. It induces a state of contemplation and meditation. Awakens the imagination.	dark blue cause depression, depression and self-doubt. Contributes to fatigue and depression	yellow
Pink	pale pink neutral. Bright pink is the excitement	It inspires confidence in stressful situations. promotes responsiveness	hot pink causes fatigue	turquoise
Blue	Relieves stress and headaches. Lowers blood pressure. Soothing. Slightly reduces the activity. Relaxes. It reduces the excitement and tension neutralizes	relieves anxiety, depression, feelings.	It evokes a feeling of alienation and cold	pink
Brown	It evokes a feeling of warmth	It evokes a feeling of stability and confidence		
Lime	cause dizziness, nausea	tones of the child and allows to reach new heights in creativity		

These colors like brown, black, white and all shades of gray are neutral for the children and in most cases do not cause any emotions and reactions.

We conducted a study to identify the color preferences of children with cerebral palsy disease.

To do this, profiles have been developed, which questions:

- adequate to the age and degree of severity of the illness of the child;
- do not depend on the level of education of parents;
- short and clear, do not need additional explanations to children with speech impairment or developmental delay;
- It combines ease of use and informative.

For the experiment were chosen the colors red, orange, yellow, green, blue, indigo, violet, lime, turquoise, fuchsia and brown, like the color in the theory is not perceived by the children, but it is often

used in children's shoes; neutral colors: white, gray, black.

In such combinations as selected combinations of colors: RED-orange; red and yellow; red and green; red and blue; Red and blue; red and purple; orange, and yellow; orange and green; orange and blue, orange and blue; orange and purple, yellow and green, blue and yellow, yellow and blue, yellow and purple, green and blue, green, and blue, green, purple, blue and blue, blue and purple, blue and purple.

The important is to determine the color tone preference. The seven survey questions are 3 variants of color lightness.

The questionnaire had to specify the sex, age and shape of the child's illness.

Introductory text profiles contained description of the subject and its purpose. Form questionnaire is given in Appendix C. The study was conducted on color preferences Novosibirsk branch of the Federal State Unitary Enterprise "Moscow Orthopedic

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Enterprise" of the Ministry of Labor and Social Protection of the Russian Federation at the time of acceptance of an order for the manufacture of orthopedic shoes, as well as in Oyashinskoy orphanage for mentally retarded children; average boarding school № 152 (Novosibirsk); secondary schools "Perspective", dedicated to the training and education of children with disabilities. In addition, questionnaires were posted on the website [146]. Thus, in the experiment, the children took part, growing both in families and in boarding domah-

In determining the age group classification used AM Gazaliyev [101] in accordance with which the groups of: 4-7 years old, 8-14 years and 15-17 years.

To determine the population must take into account the psychological state of patients developing.

To identify the number of respondents with considerable delays of mental development, it is necessary to review the classification [42] (Annex A), in which data are available regarding the safety of intelligence in children with cerebral palsy. Thus for a study with a confidence level of 95% and 5% confidence interval required sample size for ages 4-7 years was 54 human 8-14 - 81 persons, aged 15-17 years - 55 people. For ease of processing the survey results were recorded in the form of service www.surveymonkey.com [146] which automatically performs data processing on the selected criteria.

The results of the study to detect monochrome color preferences - the first question of the questionnaire for children aged 4 to 7 years are represented as color preferences diagram (Figure 2).

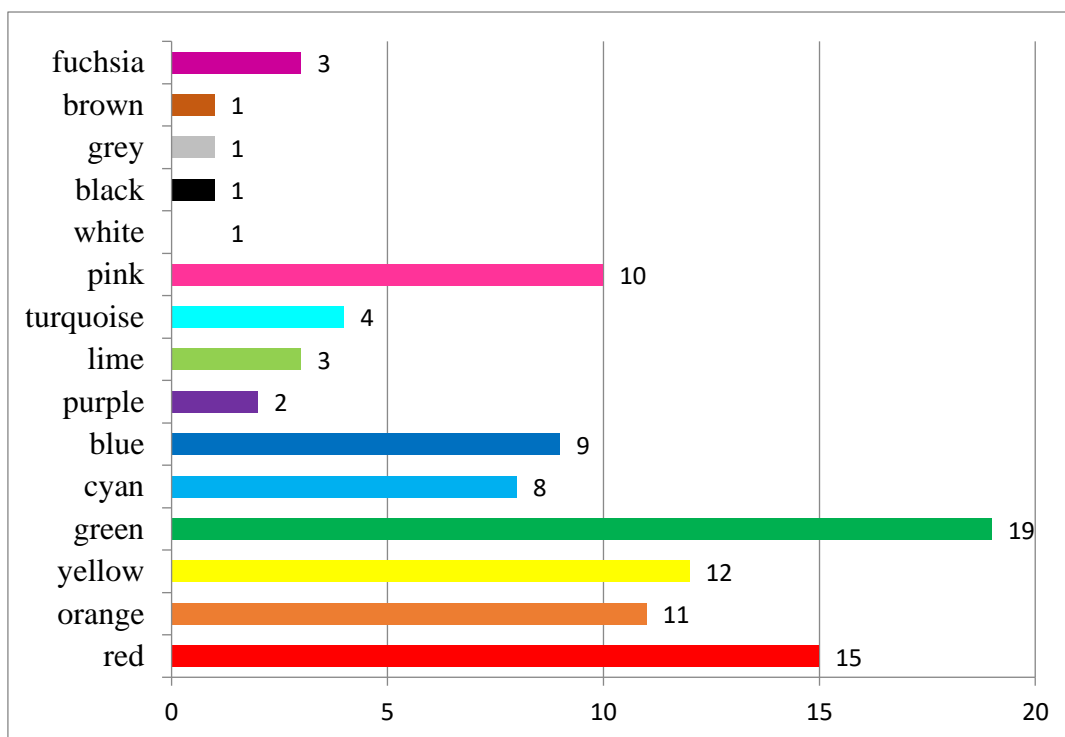


Fig. 2 - Distribution of color preferences of children aged 4 to 7 years

As can be seen from the chart, most of the children in that age group give preference to blue, blue, green, yellow, orange and red colors. Virtually chosen achromatic color, and brown, which as mentioned above is not perceived by the children and

gives them emotion. Popular pink and fuchsia, but it gave preference mostly girls, as can be seen from the diagram color preferences of children aged 4 to 7 years with regard to gender (see Figure 3).

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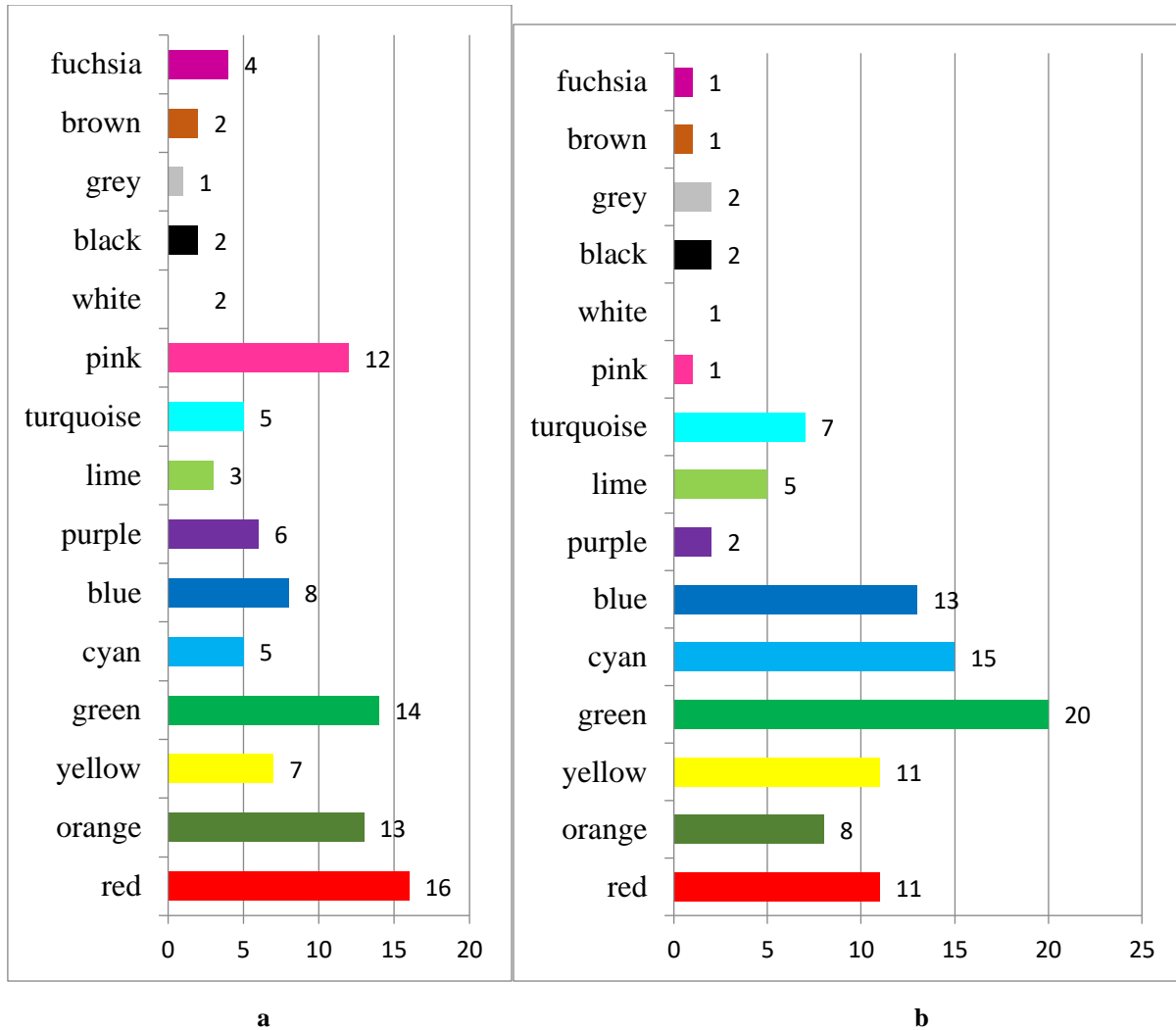


Fig. 3 - Distribution of color preferences of children aged 4 to 7 years with regard to sexual characteristics a) girls, b) boys

Analysis of color preference in the group of children aged 8-14 years (Fig. 4) shows that in a number of colors such as red, green and orange

downward trend in preferences. There is increasing interest in such colors as blue, white, gray.

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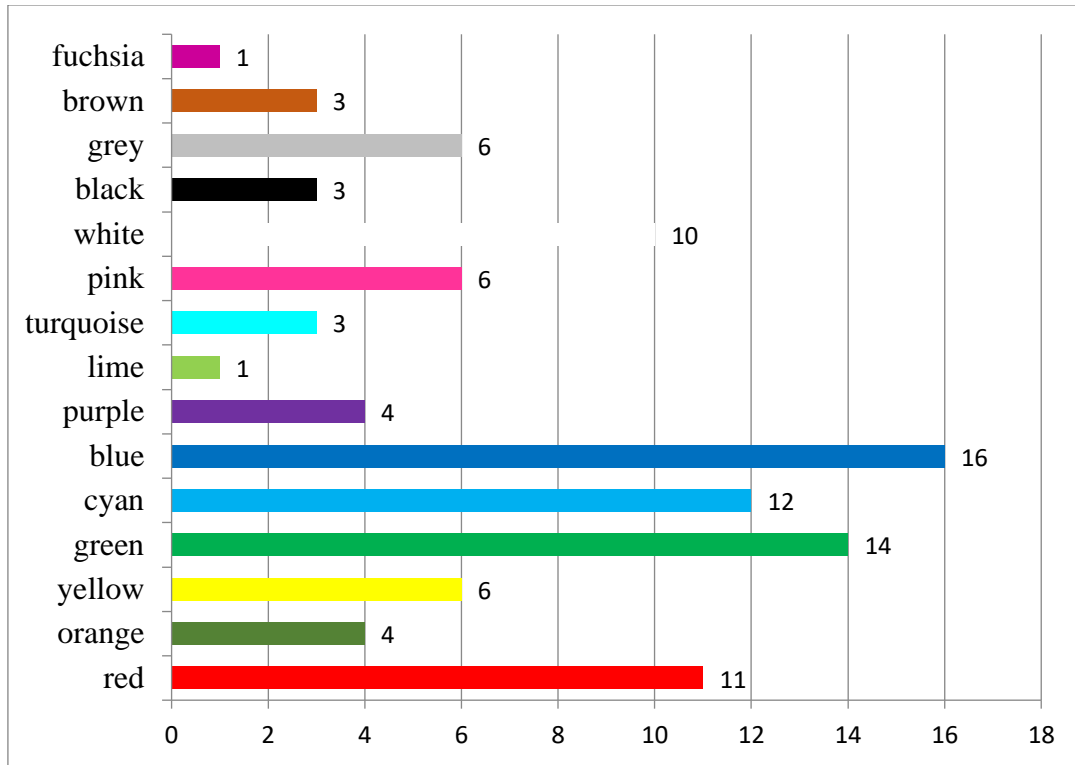


Fig. 4 Distribution of color preferences of children aged 8-14 years

The distribution of color preferences of children aged 15-17 years, presented in Figure 5, is very different from the previous ones.

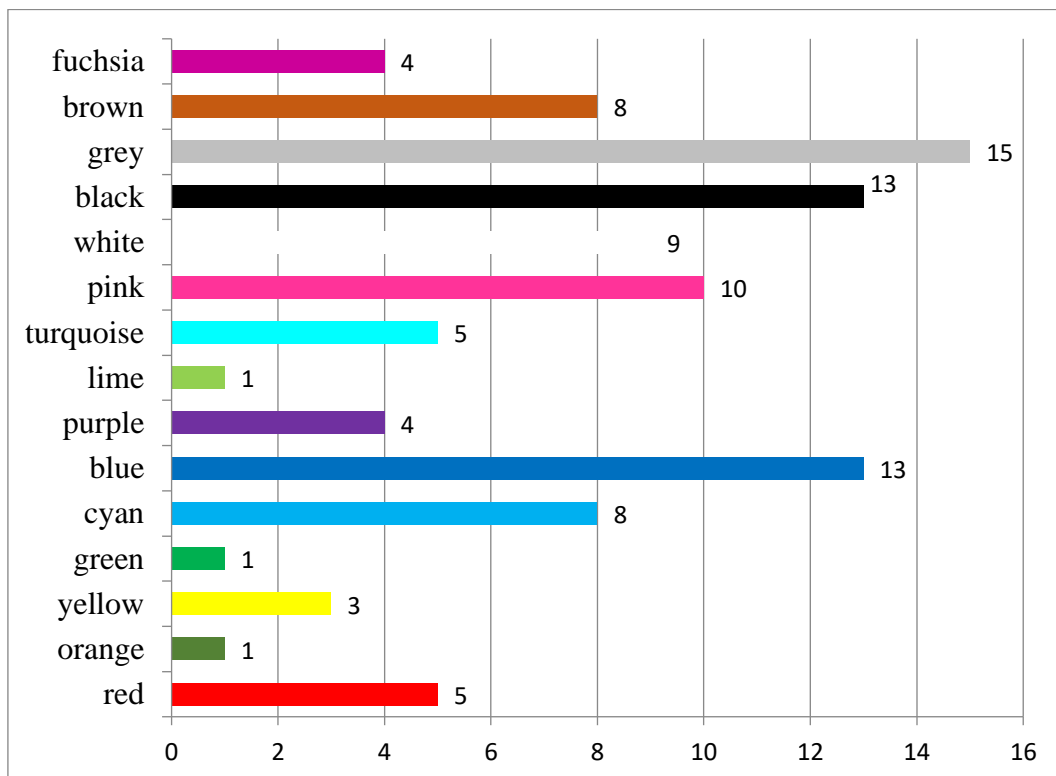


Fig. 5 - Distribution of color preference children 15-17 years

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Leading become achromatic color (white 9%, Black 13%, gray 15%), and 8% of the total number prefer brown. This may be due as a person growing up and adapting to the school dress code and general fashion trends.

A large percentage occupied by blue and pink color, but the distribution of the latter is clearly expressed by gender (9.75% girls, boys 0.25). The blue color is distributed at a ratio of 8% boys, 6% - girls.

Figure 6 shows the general diagram of monochromatic color change preferences by age groups.

From the chart it is clear that the most dramatic changes with age are subject to preferences such as the colors, green, red - to the downside; gray, white and black - in the direction of growth.

Thus there is a lack of interest (less than 8%) such as a lime color, purple, turquoise.

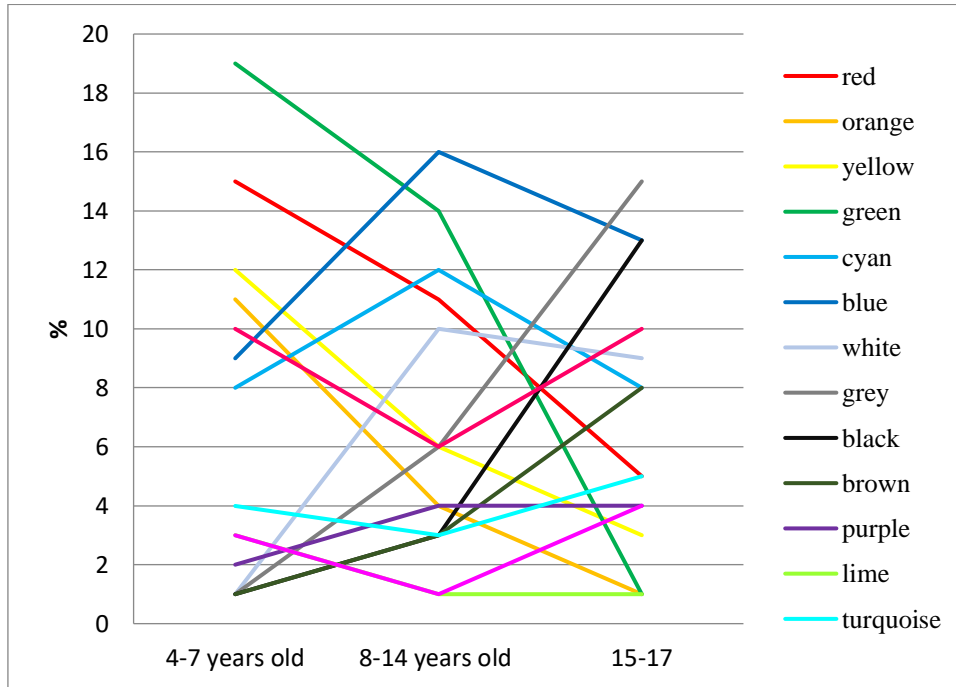


Fig. 6 - a diagram of the total monochromatic color preferences

Often shoe designs used a combination of different colors. A study to identify color combinations showed that children ages 4-7 and 15-17 do not allocate a specific combination of 2 colors. Diagrams distribution preferences color combinations shown in Figure 8 demonstrate that the percentage varies from 1 to 7. This proves unreasonableness isolation leading combination.

When analyzing the preferences of color combinations in children aged 8 to 14 years there is a tendency to the isolation of five color combinations, which accounted for 44% of the total (Figure 7).

The most popular color combinations for this age group are: blue with blue (11%) yellow blue (10%), red with green (10%), red purple (8%), and green and blue (7%).

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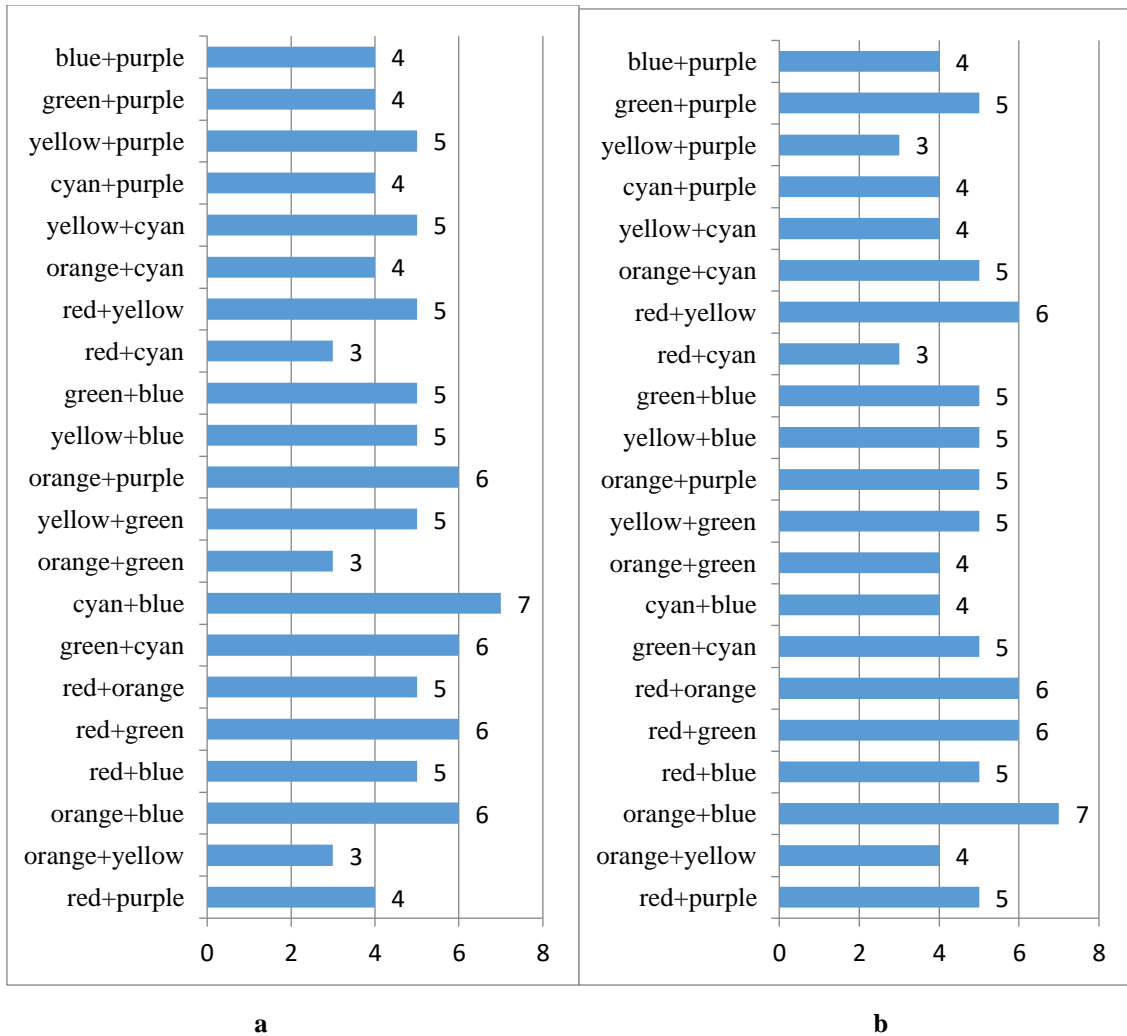


Figure 7 - Diagrams distribution preference of color combinations for children: a) 4-7 years b) 15-17 years

Another important indicator is the determination of the color tone preference. The questionnaire was given at 3-tone version of each of the primary colors. In the age group of 4-7 years (Figure 8) for all colors

darker tone it has the lowest percentage of preferences (from 4% to 11%). Light tone prevails on all colors except red (from 31% to 74%).

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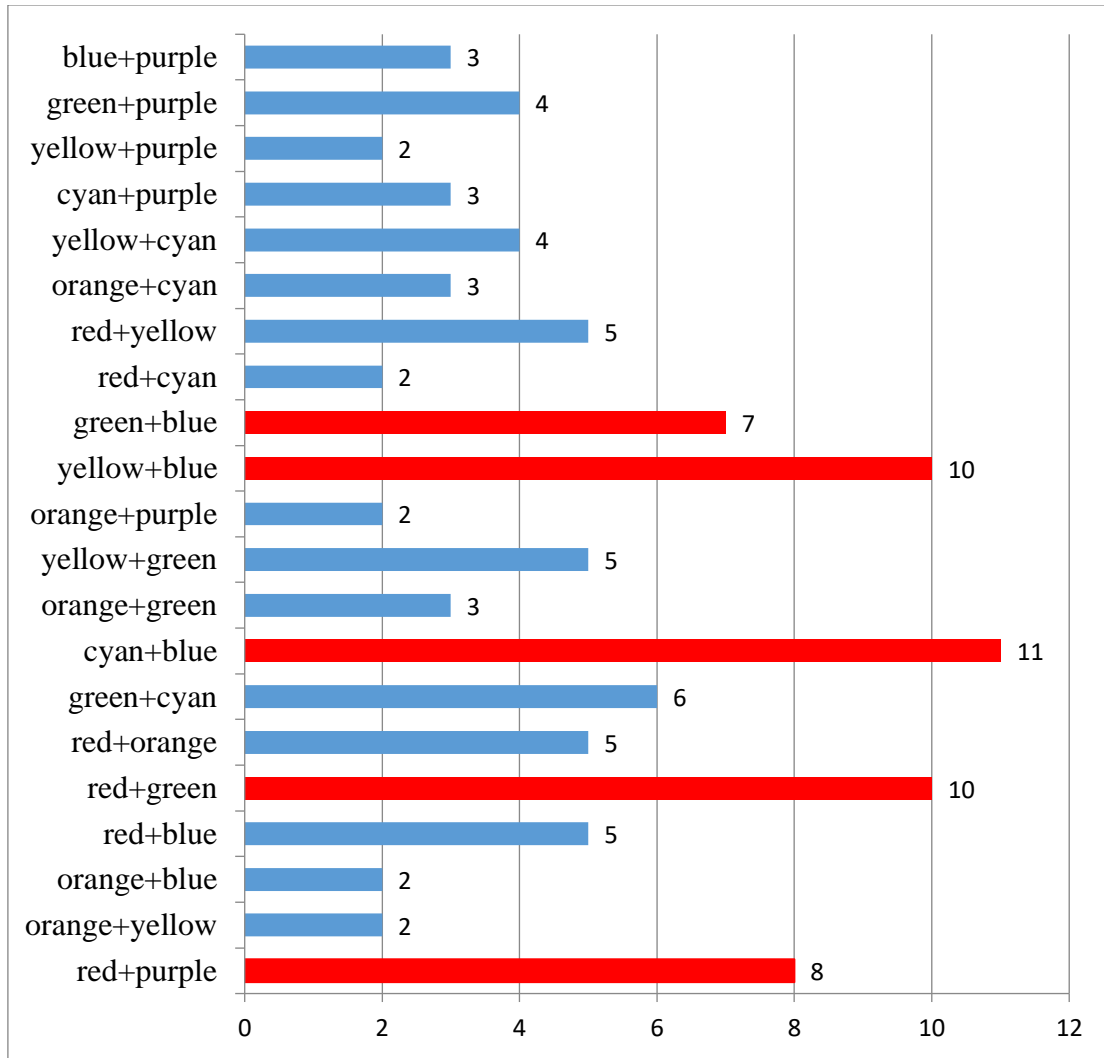


Fig. 8- preferences color combinations diagram for children 8-14 years

The distribution of color tones preferences for age 4-7 years is shown in Figure 9.

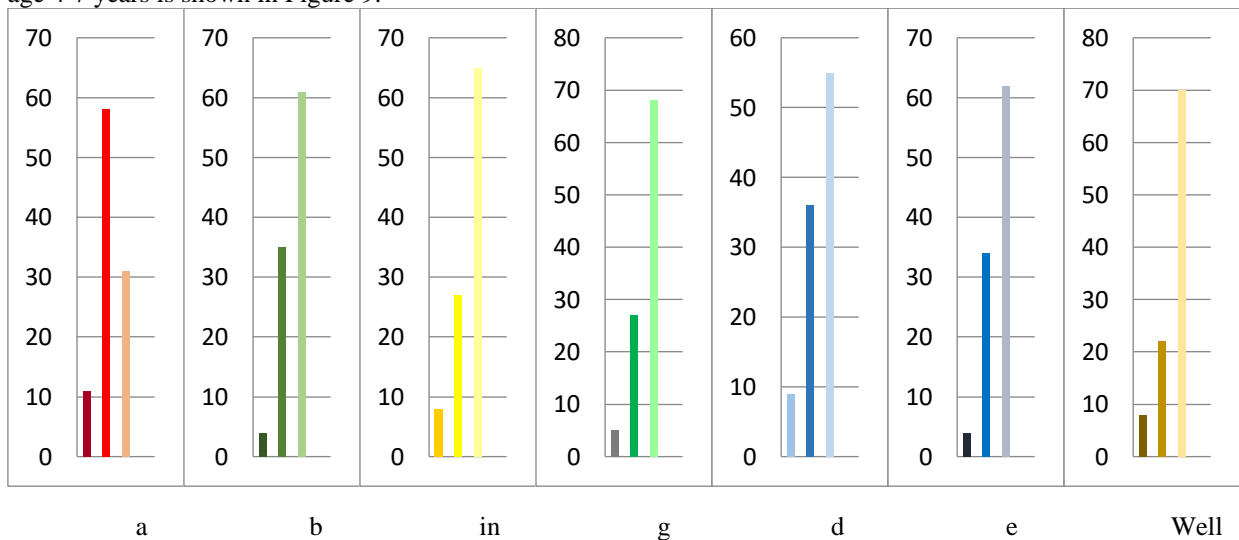


Figure 9 - Distribution hue preferences for children 4-7 years: and - red; b - orange; in - yellow; -Green g; d - blue; e-blue; Well - purple

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For the age group 8-14 years, the distribution of color preferences is shown in Figure 10.

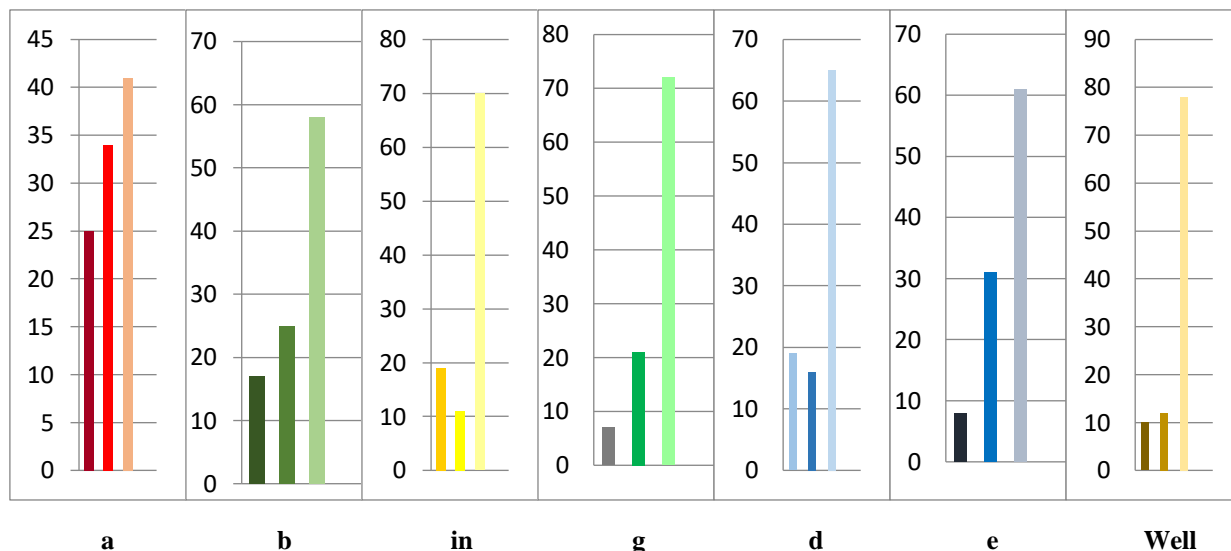


Fig. 10 - Distribution hue preferences for children 8-14 years: and red; b - orange; in-yellow; g-green; d-blue; e blue; Well-violet

Preference is given to children of light tones. Tendency to the predominance of dark tones preferences, primarily red and orange.

In the age group 15-17 years there is a tendency to abandon the original colors and the high prevalence of dark and light tones.

Distribution hue preferences for this group of children is shown in Figure 11.

The most significant predominance of dark colors seen in blue and red colors. The predominance of dark blue leads not only boys, but also to a large extent in girls. It has been a significant increase in the preferences of light-colored orange and yellow flowers. This fact may be related to the influence of the school dress code and social environment of the child.

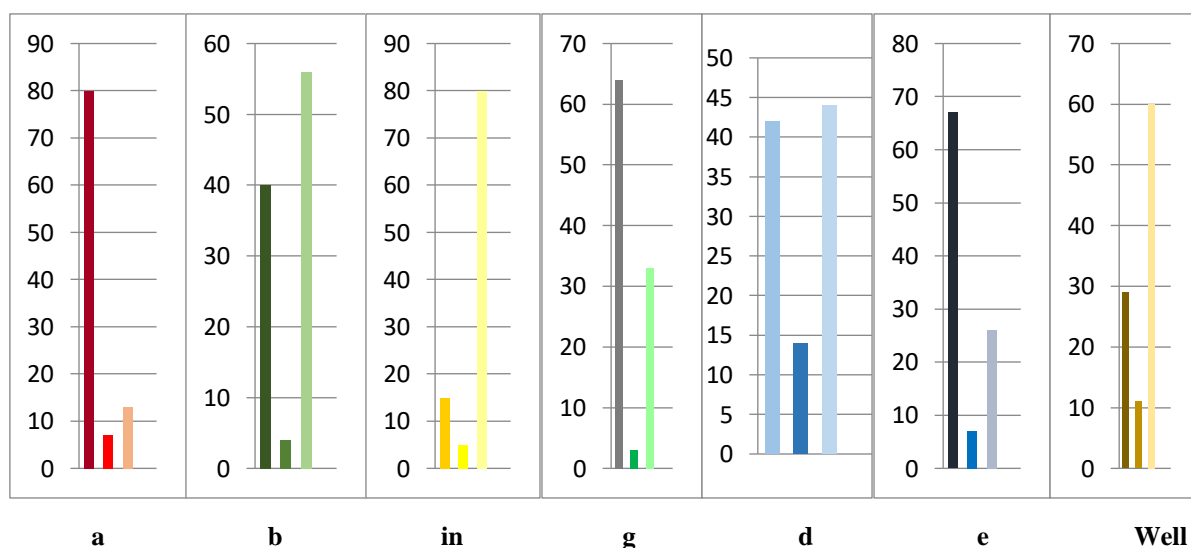


Figure 11 - Distribution of hue preferences for children 15-17 years old: and - red; b - orange; in - yellow; g - green; d - blue; e - blue; Well - purple

For all groups of children we have compiled a summary table 2 of preferences hue, where a light gray noted the predominance of light-colored, gray - the

original colors and black - dark. A few cells indicated two tones, is associated with a small difference (of up to 7%) in the results of studies on the element.

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Table 2 - Summary of the hue by preference

color	red	Orange	yellow	green	blue	blue	purple
3-7 years	dark	light	light	light	light	light	light
7-13 years	dark	light	light	light	light	light	light
13-18 years	dark	light	light	dark	light	dark	light

Based on the results, we can conclude that in the preferences of children with cerebral palsy disease is dominated by bright shades of all colors. Interest in dark shades is shown only to 15 years.

The data obtained together with the color characteristics of psychoactive effects should be used in the preparation of color products making.

For small shoe production, it is often difficult to produce a customized model Mass shoes in different color combinations, so there is a need in the selection of a universal palette as by sex and age, and with respect to fashion trends, and rehabilitative effect.

In this study, for the first time developed a classification of footwear on the criterion of

'Rehabilitation color effect ', which is shown in Figure 12.

The proposed classification highlighted three areas of orthopedic footwear: the ultra-a customized, mass and a customized in the style of "unisex". In the shoes of the latter category of patients is necessary to abandon the flowers with a strong affiliation to any - or the floor, as well as flowers, causing a strong impact on the body and psyche of the child. In the design must take into account the range of the selected size range, and on this basis to determine the size of patches of color in the product.

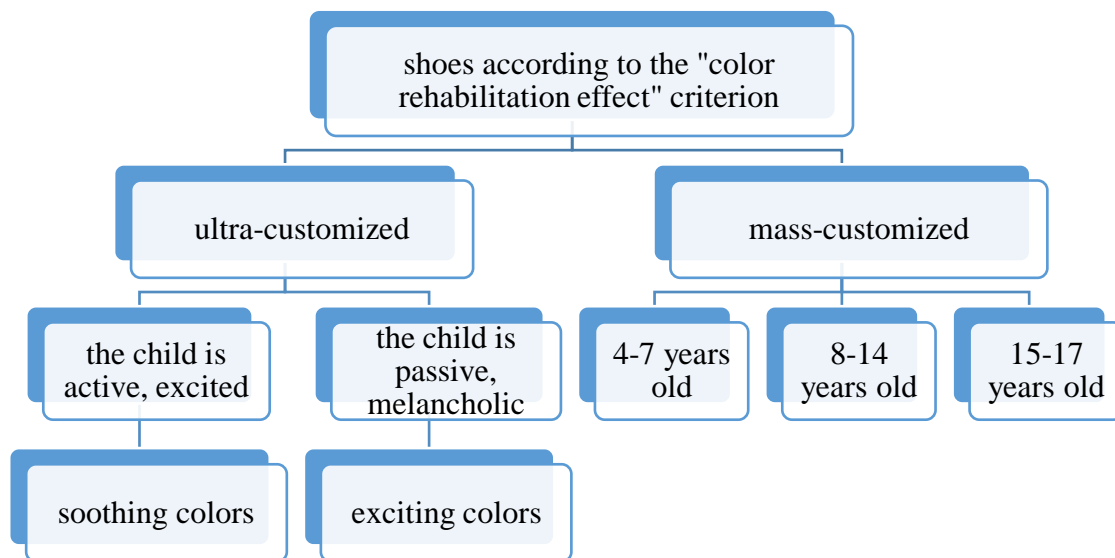


Figure 12 - Classification of footwear on the criterion of 'Rehabilitation color effect '

After studying and analyzing the impact of color on a child with cerebral palsy disease in combination with color preference, we have drawn up recommendations colors mass a customized shoes:

Age 4-7 years:

- red color;
- light shades of green;
- light shades of blue;

- light shades of blue;
- orange colors.

In this age group, it is recommended to use as starting combination with light colors and combination of colors of two initial colors which are in nyuansovom regard. Shades of red can be used with achromatic colors and light tones.

Age 8-14 years:

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- lighter shade of blue;
- lighter shade of blue;
- lighter shade of green;
- darker shade of red;
- darker shade of orange.

In this age group, it is recommended to use light shades of these colors, their combination with achromatic colors like light and dark tones. The decoration can use contrasting colors like dark and light tones.

Age 15-17 years:

- achromatic color;
- darker shade of blue;
- lighter shade of blue;
- Brown color;
- bright colors of orange, yellow, blue;
- dark shades of red, blue, purple.

In this age group it is recommended to use a combination of 2 light or 2 dark tones of different colors; combination of light and dark tones of the same color or achromatic colors.

Examples of models of footwear, made in different colors, shown in Figure 13

In the ultra-a customized footwear is recommended colors, neutralizing one or another mental disorder child. Conventionally rehabilitative effects can be divided into two groups: the color of soothing and stimulating colors. The classification scheme as presented in Figure 14.

In the manufacture of orthopedic shoes, most models undergo significant changes depending on the size, fullness, or the height of shoes. Proportionality parts of footwear in different sizes can be significantly different. As an example, Figure 17 is a drawing 3 sizes (19, 26 and 33) models summer shoes.



Fig. 13 - Examples of models colors mass a customized shoes for children 15-17 years old with the disease cerebral palsy

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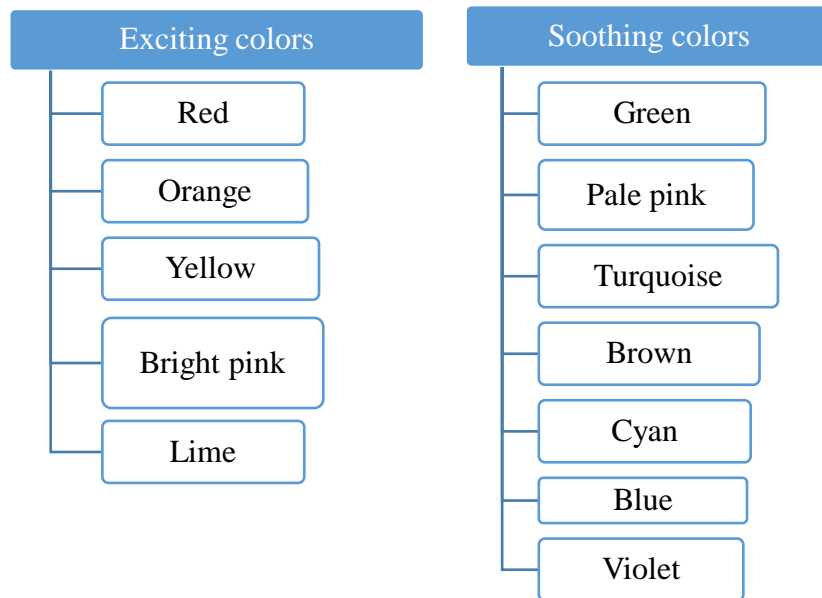


Fig. 14 color classification on the effects on the child's psyche

As seen in Figure 15 the design proportion in 3 different sizes. It should also influence the choice of colors and models of fittings. Therefore, the selection of color solutions need to focus both on the age of the

patient and on the size of the foot, given the combination of a color scheme with the specific design of orthopedic footwear.

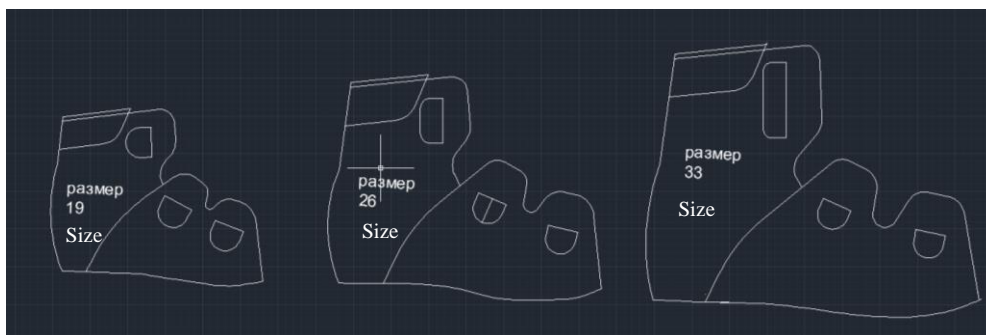


Figure 15 - The drawings of summer shoes three sizes

A combination of vibrant colors look better in the shoes of the track is not more than 165 mm in length. In the shoe with the greater length of the track recommended combination with achromatic, dark or light colors, or plain construction.

Technical Data Pediatric prophylactic shoes for flat-valgus deformity of the foot

Preventive shoes must pursue three main objectives:

- 1) to cause a targeted pressure on the bones of the foot, to determine its formation in the desired direction;
- 2) prevent progression of arch settling in the presence of the early ploskostpiya forms;

3) To enable the normal kinematics of the foot (Figure 16).

Marking a line in the form of color zones corresponding to the valid position of the boundary of the toes in the shoe allow you to monitor compliance with the size of the shoe size of the foot, which is especially important in the selection of shoes for young children who are not able to independently determine suits them this shoes or not, as well as periodically monitor compliance with the shoe size. Until a few years ago, orthopedic shoes prescribed by a doctor only in case of serious violations in the development of the foot in children and was little attractive in appearance - but now the situation is quite different. In the specialized salons and a beautiful range of quality orthopedic and prophylactic footwear

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is very diverse. Prophylactic anatomic models have longitudinal adjuster short, rigid heel and pyatochku, by which is achieved an even and correct load

distribution. The heel of the foot in anatomic shoe is fixed, and the child's leg is not "collapses".



Fig. 16 Preventive shoes for flat-valgus deformity of the foot

Due to distribute the load evenly across the foot of the child, children's preventive orthopedic footwear helps to properly form the leg of the child. Anatomical longitudinal arch support is suitable for all children, without exception, the size of the hard backdrop verified thoroughly, and can not prevent the further formation of the foot. Since the longitudinal arch of the foot in children is formed before the age of three, and the instep of shoes for children should not be too high-stop should form itself, naturally. Therefore, if there is no other special orthopedic indications - enough preventive orientation of shoes. For the proper formation of the foot to walk in such shoes needed as much as possible - not only outside but also at home. After three years of the child's foot is considered to be finally formed, and if there are no other, more serious problems, and violations can continue to wear prophylactic orthopedic shoes. Orthopedic corrective shoes. For valgus or varus deformity foot or flat foot must wear corrective orthopedic shoes. In the presence of the child diseases such as cerebral palsy and diabetes, medical orthopedic shoes should be worn necessarily. This is due to the general weakness and instability of joints with cerebral palsy and fragility of blood vessels in diabetes.

Orthopedic anatomical arch support. Shoes "Perseus" is made at special orthopedic pads anatomic profile which corresponds optimally shaped foot baby. This design allows pads to sew shoes with arch support insoles pledged, whose main task is the correct formation of the arch.

Tight fixation of the foot of the child and of sufficient height tibia in all models. When designing preventive orthopedic children's shoes a lot of attention is paid to every shoe firmly fixed stop child and held it in the correct position. Dense fixing foot achieved by high lacing or clasp "Velcro" with a large area.

Molded hard heel. The is made of thermoplastic material required density of children's shoes "Perseus" hard backdrop. Backdrop anatomically designed height and shape for each shoe size and has extended the inner wing. Paired with arch support heel provides the most effective support to the arch of the foot.

Roll soles. The sole is used in the production of children's shoes "Perseus," Hasroll in the forefoot with a certain angle that helps the child while walking properly set foot and did not stumble. Nosochno-beam portion of the shoe sole - flexible and rear - rigidly fixed gelenkom-instep made to the structure of shoes and disposed at a distance, calculated for each resolution. If the shoe sole bends in half, then these shoes can harm the child's foot, because Stop not anatomically designed for flexing between the beam and the heel (gelenochnoy parts).

Natural high-quality materials. In the production of footwear uses only natural high quality materials: leather and nubuck, allowing to carry out aeration of the foot. All materials and components are certified. The principle of action-2-sided hard Berecz fixes the ankle in a vertical position and holds the heel of the foot separated from valgus deviation due Kita tibia on the inside (Figure 17).

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Fig. 17 Standard design prophylactic shoes plane strephexopodia

- Individual display of the longitudinal arch on the instep of an elastic material, provides the necessary support to the arch without limiting spring foot function. The disadvantages of this design is the excessive stiffness in the ankle joint and feel uncomfortable with a child. Known removable insoles, which consists of soft elastic bottom layer, a flexible top layer, as well as of the studs, space fixed in the lower layer and on the surface of the insole groups at small distances from each other in the areas selected from the viewpoint reflex therapeutic massage, with this user various reflex zones of the foot sole are displayed on the surface of the insole marking lines. Removable insoles reflektorno- provides therapeutic foot massage.

The disadvantages of the prior art solutions are that removable insoles do not provide conditions for proper installation of the foot iprofilaktiki its static deformation makes it impossible to judge the size of the shoe according to the size of the foot. Removable insoles for children preventive 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 the lower frame layer of dense thermoplastic material, the intermediate layer is formed with a recess in the heel portion under the tubercle of the calcaneus sectional 0.18 D and computation with uniform internal and external arches in gelenochnoy portion with the highest point in calcaneocuboid ochleneniya sectional 0.36 D, and the top layer of the insole in the forefoot portion applied dimensional scale markings and a line color zones corresponding to the permissible boundaries position the toes in the shoe and allowing the process of fitting when installed on the foot taken out of the shoe insole judged gimp insole according to length and, accordingly, the length of the shoe size of the foot to the construction requirements Development of preventive shoes based on the basis of anthropometric and biomechanical studies.

When designing preventive elements of the shoe must be made taking into account the complex spatial form of the longitudinal arch of the foot and its sections. The complex shape of the arch is not taken into account before the design of supplementary devices, supports the arch. Meanwhile, only the maximum under the arch profile may provide the minimum partial pressure of the liner on the foot and painless wearing it. Existing liners, such as liner TSNIIP, which has a triangular shape, these requirements does not meet. Hence the problem in the design of removable insoles are reduced to create inserts with profiles typical for a specific age and gender group. Comparing the profile radiographs stop with their fingerprints and konturogrammami profile obtained on a special device, we found that the maximum height of the longitudinal arch on the inner edge corresponds to the middle of the navicular bone and is in section 0.40 of the foot length. The maximum height of the arch of the foot corresponds to the edge lateralnomu calcaneocuboid articulation. Thus, the highest part of the arch extends Shoparovskogo joint line. Normally, corrective insoles are mounted so that their maximum height corresponds to that level. However, it is necessary to shift the insole top few back to the cross section length of 0.38 foot. With this arrangement, the insole will be at its peak of a triangular space formed calcaneal-scapoid ligament, over which the head of the talus is located. It is on this site, not at the top of the arch. Rational shoes, ie corresponding anatomical and physiological characteristics of the foot, it ensures its normal operation, prevents deformation and diseases, the development of flatfoot, abrasions, calluses or the like Tight shoes as too loose, harmful, and may even be the cause of some diseases of feet. Short and narrow shoes restricts the movement of the joints, is almost completely eliminates the mobility of the fingers, leading to their curvature, ingrown nails, and also violates the sweat and blood circulation. Therefore feet in tight shoes quickly freeze and cold feet - a

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common cause of colds, inflammation of the kidneys and bladder. Too wide and free shoes leads to displacement of the foot during the motion, causing possible subluxation of the ankle, disturbed gait.

In order to pick up the shoes, you must correctly identify the size of the foot. It will be appreciated that the size of the foot under load is increased, both in length and in width. Flatfoot - the disease is extremely common, we can say social. To verify this, just to talk with relatives and friends: "every step" heard complaints of pain in the feet, the muscles of the lower leg in the knee, and even hip. The most common cause of pain - the flattening of the feet. A significant prevalence of foot deformities, flatfoot often static, reduces disabled people. Prevention and treatment of foot deformities associated with flat feet, are of great public value. To prevent the occurrence of foot deformities should wear shoes rational design, to comply with the labor regime, rational working and living conditions, to exercise and massage, use a corrective device. For flat feet, bending of the thumb, fingers hammertoes and other strains used corrective devices. Their purpose - to protect the feet and toes of the progression of deformities, relieve muscles and ligaments overload (by mechanical, passive support for the longitudinal and transverse arches) go to protect the painful areas stop when deformed fingers, calluses, corns, constant abrasions. Correction appliances are simple, can easily be produced in large quantities and individually. They are in addition to normal shoes. One type of corrective devices for flat feet are insoles.

Their task - to bring the heel of the position of pronation and support the arches of the foot during muscle fatigue. Given that muscle failure occurs only when the muscles are tired transferred, arch supports should be located below the highest point of the arch, so that only the period of fatigue vaults rested on him. Arch support can relieve pain and prevent the development of deformation. By appointment insoles divided into insoles for maintaining the longitudinal arch, maintaining the longitudinal and transverse arches, maintaining the transverse arch. Depending on the materials used insoles can be divided into hard - leather with a metal plate, elastic - leather insole and

various calculations in podsvodovoy portion (leather and cork) of plastic or rubber. If gelenochnoy of the shoes can not withstand the load of the foot and flex, rigid insoles are used - a metal plate is not deformed and firmly holds the arches of the foot. However, use of these arch supports leads to restriction of the function of the foot muscles, appearance Stiff gait. Central Institute of Traumatology and Orthopedics named Priorov designed elastic insoles of plastic. They can not bind the skin, as they do not cause sweating. Arch supports in the form of small preventive liners are used for the maintenance of the longitudinal arch. Inserts are inserted into the insole pocket. Arch supports for the longitudinal and transverse arches, in addition to lifting the longitudinal arch support transversal arch. When transverse flat leather insoles can be used with the bulge of soft cellular plastic to maintain the transverse arch. When transverse flat and considerable spreading feet sometimes it is necessary not only to support a cross vault, but also to pull the stack in the middle. In such cases it is recommended to use a cuff of the binding rubber or rubber tape with stitched to maintain the transverse arch gaskets.

In the event of the thumb between it and the second finger is inserted into the coil-shaped gasket, which deflects the thumb inside. To increase the deflection of the thumb into the opening gasket lay sponge rubber, porous plastics, wool. A feature of the base module orthopedic insole disclosed in providing a positive effect of its use is the ability to stack priformovyvaniya topography due to the presence of elastic prostilki 2-4 mm thick. prostilki material - foam, the apparent density of which is related to the thickness and inversely proportional selected from the range 90 - 45 kg / m³. Prostilka located under the skin of the backing coating. Under the influence of pressure accented corns bone protrusions or recesses formed in prostilke, increasing the contact area and the insole plantar surface of the foot. This reduces the pressure on the brake painful areas.

Range characteristic of winter, autumn, spring and summer of orthopedic shoes for girls and boys are presented in Figures 18 - 26.

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Fig. EXAMPLE 18 correct children's shoes



Fig. 19 Orthopedic summer footwear for children (sandals for girls)



Fig. 20 Features orthopedic shoes for children

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Fig. 21 Orthopedic summer footwear for children (for boys sandals)



Fig. 22 Orthopedic winter boots for children (boys and girls)



Figure 23 The range of orthopedic shoes for children

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Fig. 24 year old range of orthopedic shoes for children



Fig. 25 year old range of orthopedic shoes for children

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Fig. 26 The range of orthopedic shoes for girls and boys

range analysis orthopedic shoe for patients with cerebral palsy

Range of children's orthopedic footwear is wide, requiring its classification and identification of the basic models. To solve this problem we analyze the designs of shoes manufactured by enterprises of Russia specializing in the manufacture of orthopedic shoes. Thus, the construction of the "envelope" is made orthopedic enterprise Barnaul, Tomsk, Novokuznetsk, Ulan-Ude, Chita, Kirov and Lipetsk, Kaliningrad, Rostov, Syktyvkar. Table 3 shows the

photographs of models with insulated footwear, made from industrial business directory. For clarity, the structure transformed into a technical drawing in the description of their structural elements. Table 3 - Constructions shoes with their configuration bertsami illustration products Technical drawing Structurally decorative elements 1 2 3 laced boots with soft edges. As a decorative use decorative stitches

Table 3 - Constructions shoes with their configuration bertsami

illustration products	technical drawing	Structural and decorative elements
1 	2 	3 Lace boots with soft edging. As a decorative use decorative stitches
		Shoes with laces. As used their configuration decor decorative elements contrasting color

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		Lace boots with soft edging. In used as a decoration: the division of parts, parts contrasting in color saturation
		Lace boots with soft edging. In used as a decoration: the combination of colors, stitching in a contrasting color
		Lace boots with soft edging. As used decor division parts, parts of neutral colors
		Boots on the tapes "Velcro" with soft edging. As decor used: partitioning parts, parts related colors.

The most popular design is the type of "envelope" with bertsami boots, ankle closing for frame details. Illustrations articles, technical design drawing and description are given in Table 4.

Various modifications to these models can be obtained by partitioning parts, their configuration using decorative items, decorative items and accessories.

Table 4- designs of summer shoes with open toe part

illustration products	technical drawing	Structural and decorative elements
1	2	3
		Shoes with soft edging tape fasteners. In used as decoration parts division, a combination of flowers, applique

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		<p>Shoes with Velcro tape. In used as decoration parts division, a combination of flowers, applique</p>
		<p>Shoes with soft edging tape "Velcro" and buckles. In used as decoration parts division, a combination of flowers, applique</p>
		<p>Shoes with soft edging tape "Velcro." In used as decoration parts division and combination of colors</p>
		<p>Shoes with soft edging tape "Velcro." As used decor articulation parts</p>
		<p>Shoes with soft edging tape "Velcro" and buckles. As a decorative use: the division of parts and combination of colors.</p>

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Table 5 Construction of summer shoes with high bertsami and vamp with an elongated tongue

Illustration products	technical drawing	Structural and decorative elements
1	2	3
		Summer shoes with a closed nose and the vamp-tongue. fixing method on the foot - tape "Velcro." In used as decoration parts division and combination of colors
		Summer shoes with a closed nose and the vamp-tongue. fixing method on the foot - tape "Velcro." In used as decoration parts division, a combination of flowers, applique
		Summer shoes with a closed nose and the vamp-tongue. fixing method on the foot - tape "Velcro." In used as decoration parts division, a combination of flowers, applique
		Summer shoes with a closed nose and the vamp-tongue. fixing method on the foot - belt buckles. As a decorative use unusually shaped buckle and preformation on uppers
		Summer shoes with a closed nose and the vamp-tongue. fixing method on the foot - belt buckles. As a decoration used: stitching in a contrasting color and perforations on the vamp.

The closed part of the shoe beam creates difficulty dressing shoes for patients with severe contractures of the ankle and foot paresis. There are 2-clamp technique, the shoe on the foot: Velcro tape and buckles, as well as in the previous model can be a combination thereof.

The third model - summer shoes oversized bertsami and closed toe portion (Figure 27). The model has a number of limitations: absolutely not suitable for patients with severe contractures of the ankle joint, paresis feet, deformities of fingers, etc.

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Fig. 27 - Models of the shoe summer oversized bertsemi and closed toe part

For the purpose of this design for patients with paresis of the foot or slight contractions necessary soyuzochnoy shortening of the shoe to the foot uncomplicated input in vnutriobuvnoe space. For

constructive vamp length standards used Velcro tape width of 2.5 cm and more which extend soyuzochnuyu of the shoe (Fig. 28).



Fig. 28-year old model shoe with increased due to belt vamp

Thus, allocated four basic constructions of shoes for patients with cerebral palsy disease. We take them as a base. Examples of designs are shown in Figure 29, and description thereof - in Table 6.

Table 6 - Description of basic models of orthopedic footwear for patients with cerebral palsy disease.

boots	Footwear summer with high tibia part		
their configuration ankle boots	open toe part	closed toe portion (vamp with an elongated tongue)	closed toe portion (vamp without tongue)

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Fig. 29 - Models orthopedic shoe for patients with cerebral palsy disease.

Various modifications to these models can be obtained by partitioning parts, their configuration using decorative items, decorative items and accessories.

To ensure the necessary degree of locking shoe on the foot ribbons "Velcro" bertsami design proposed in the recess in the crook of the ankle joint, thus changing the distribution of resistance forces. An example of the proposed design solution is shown in Figure 30.

3.3. Classification of shoes for people with cerebral palsy in the degree of rehabilitation effect

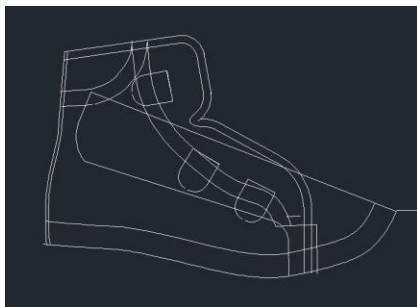


Fig. 30 - Options for changing the shape of tibia orthopedic shoes

Figure 31 is a drawing showing the structure of shoes with high rigid backdrop (shaded) with a weak degree of fixation. shoe design is indicated for minor

deviations in the lower extremities. Rigidity backs provided using polymer materials, or skins increased thickness.

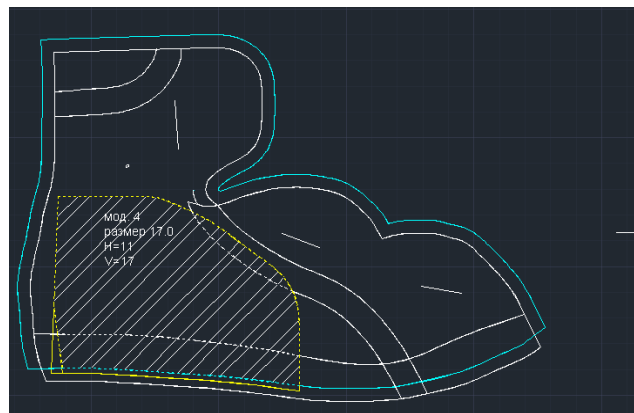


Fig. 31 - Construction of shoes with high backdrop rigid (with a weak degree of fixation of the foot in space vnutriobuvnom)

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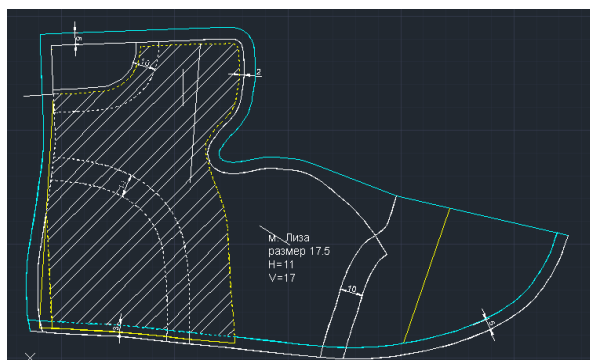


Fig. 32 - Design shoes with hard tibia (with a higher degree of fixation of the foot in space vnutriobuvnom)

In this model, high hard Berecz (shaded) is used with a higher degree of fixation of the foot (Fig. 32) as the frame parts. Recommended method of fixing the shoe on the foot are the buckles and laces.

In the model shown in Figure 33, the frame parts are high rigid ankle boots in combination with rigid barrels, which ensures a significant degree of fixation. This design of shoes is designed for children with significant deformities of the lower extremities.

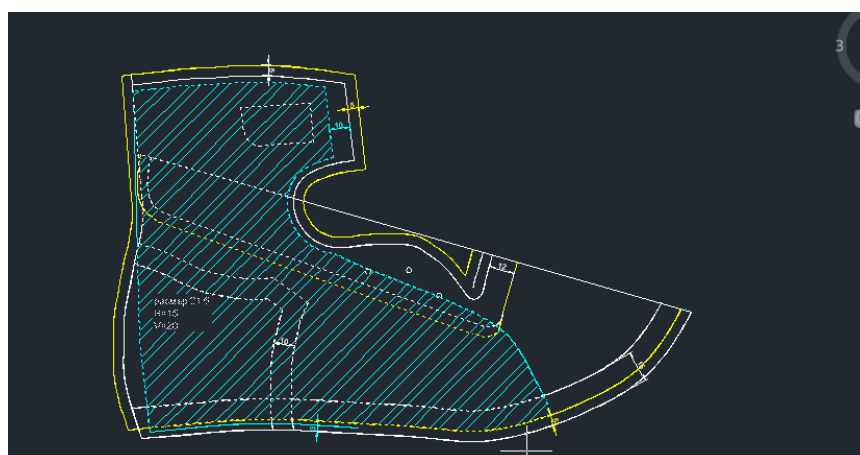


Figure 33 - Construction bertsami shoes with hard and rigid barrels (with considerable degree of fixation of the foot in space vnutriobuvnom)

Continued - Part 2

introduction

The design of preventive footwear designed to prevent abnormalities of the foot, especially the static deformation. It is available on the pads for the mass manufacturing of shoes average (fourth -Six) completeness or blocks increased fullness. Preventive elements of the shoe are insoles polustelki, calculations of the longitudinal and transverse arches.

The design of orthopedic shoes tailored to the abnormalities of the foot, lower leg or thigh.

When orthopedic disorders complicated (it is primarily the degree of heavy dynamic deficiency diseases) special shoes assigned only after the maximum possible deformity correction by modern

orthopedic surgery. In diseases with static lung failure and some forms of dynamic deficiency disorders - contrary to surgery is resorted to only in extreme cases where the conservative treatment in conjunction with an orthopedic shoe is inefficient.

Orthopedic footwear serves the following purposes:

- Make sure the support, ie, facilitate walking and standing at more or less the defect stack if the deformation can not be removed surgically or if the patient refuses operation;
- corrected initial, unstable deformation of the stop;

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• notify the progression or recurrence of deformation;

- to increase the area of support feet;
- compensate for the shortening of the limbs;
- to support the arch of the foot, to relieve painful areas;

- facilitate walking in orthopedic devices;
- mask cosmetic defect, and others.

Orthopedic footwear is made of all types and designs

and may have low (0-29 mm) or medium (30-49 mm) heels.

Depending on the degree of severity of the strain of foot orthopedic shoes is divided into maloslozhnuyu and complex.

Maloslozhnaya orthopedic shoes designed for people with moderately pronounced deformation of the lower extremities. Shoes produced increased fullness (up to 13th) for a special orthopedic pads.

It is also possible serial production of such shoes. In this case, under the maloslozhnoy orthopedic shoes is to be understood such, the internal shape of which is standardized and designed to meet the anatomic changes of lower limb pathologies, for which it is designed. Thus individual approach to treatment is provided by varying the supplementary profile orthopedic insole, whose parameters are taken into account when designing the inner shoe shape. Thus, loose profiled orthopedic insole is not a separate supplementary device, and developed a special detail maloslozhnoy orthopedic shoes.

In most cases, orthopedic footwear maloslozhnaya appointed:

- in functional insufficiency (relatively rare);
- static deformations moderate;
- diseases on the background of functional impairment and static deformation;
- relative limb shortening up to 30 mm;
- hollow foot.

Construction maloslozhnoy orthopedic shoes, appointed in functional insufficiency stop distinguished by the presence of household:

- special parts (loose attachments);
- vnutriobuvnogo additional space for insertion of these devices.

Shoes can be made of all kinds, heel height - low or medium.

Sophisticated orthopedic footwear designed for individuals who have expressed strain and foot defects. It refers to a complex footwear, having at least two special parts or orthopedic Kosok to compensate

for shortening of 30 mm or more. This shoe is available both in standard blocks, and on plaster casts. Footwear includes special parts, correcting the position of the foot: rigid vamp, ankle boots, laying open vault, pronator, oblique or elongated heels, etc.

Complex orthopedic shoes can be divided into two major groups:

- corrective shoes, the purpose of which is more amenable to correction corrective deformations, such as paralytic clubfoot, etc .;

- footwear, the purpose of which is to compensate for various incurable deformations uncorrectable surgically, such as stumps foot, various shortening etc. Complicated orthopedic footwear characterized by the special design of the top and bottom. Its production is almost always done individually.

Main part

Orthopedic orthoses (Correction products)- a external device curative and preventive effect which is intended to modify the functional and structural indicators and skeletal neuromuscular system (Figure 18 - 23). This definition, which offers Wikipedia. So, what is this brace? Simply put, this medical product necessary for unloading and support of patients, injured, operated joints or limbs.

The term refers to several types of orthosis devices:

- corsets;
- Washer;
- bandages;
- Special shoes and night splints at heel spur;
- Orthopedic insoles.

They are worn with unstable ligaments, after injuries and operations during active exercise, in diseases of the musculoskeletal system. The need for fixation and unloading of the joints (ligaments) can occur in the following cases:

- Paresis or paralysis (including post stroke state);
- Predisposition to the appearance or presence of contractures (including cases of CP);
- Congenital diseases of the musculoskeletal system.

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Figure 18 - Basic functions orthopedic ortreza

Functional products depends on its purpose. The main tasks that perform different types of orthoses. It should be borne in mind that one bandage or corset may have just two or three functions:

- fixing a certain area in the right position, its stabilization and unloading;
- recovery of locomotor function after limb and tissue damage (expansion, fractures, contusions, sprains and subluxation) or of surgical interventions;

- correcting defects caused by congenital or acquired deformities of the musculoskeletal system (a kyphosis, scoliosis);
- prevention of spinal injuries and joints during intense exercise (sports strength training, active work of his hands, long driving);
- pain syndrome, which causes chronic diseases (arthrosis, arthritis, osteochondrosis, spondylosis and many others).

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Figure 19 - Classification of modern orthoses

All modern orthoses can be divided into three groups in terms of their purpose:

- dorsal (cervical collars, thoracic and lumbosacral braces, recliners, prenatal and postnatal female bandages and the like);
- orthoses upper limb (arm locks, wrist supports, elbow pads, orthopedic napalniki etc.);
- products for lower extremities (hip and ankle supports, knee pads, orthopedic insoles, shoe clips).

Medical devices of this type are prepared and the individual:

- ready and braces are made in factories in a wide dimensional range;

- customized orthoses produced according to the order in orthopedic casts workshop with the damaged portion.

According to the fixing level (degree of hardness) the following types of products:

- hard - immobilizers. A distinctive feature of this category - plate and metal ribs. They restrict movement and fix the joint in the correct position. As part of the technical equipment of the presence of metal and plastic fasteners, straps and fasteners, hinges, magnets, removable pelota. The purpose of wearing - the protection of the weak, the sick limbs from damage and subsequent deformations. Such products are used and during the postoperative recovery to normal accretion of bones;

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Figure 20 - Semi-rigid brace

- semi - the most popular and extensive group of orthoses in which there are many subtypes. They vary in shape and design details. Almost all are equipped with plastic or metal stiffeners. Products may have straps, buckles, Velcro fasteners and other

options for the establishment of the necessary tension level. Possible functions: elimination of pain syndromes, unloading joints, injury prevention, treatment of diseases of the musculoskeletal system



Figure 21 - Soft brace

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- soft orthoses - is bandages of stretch fabrics or wool, designed to relieve pain, reduce inflammation. Some models operate

- massage or warming function, accelerating recovery and kupiruya pain syndrome. They are useful for the prevention and the treatment of minor injuries.



Figure 22 - Soft brace of wool or elastic fabrics

Criteria for selecting the device-orthosis

If you are at the initial stage of the selection brace, do not rush. There are lots of criteria to help you find the best option.

Recommendations doctor - orthopedist

Modern orthosis for the back, knee, elbow or any other joint can perform a variety of functions. Its capabilities are directly dependent on the shape and structure, so these parameters should be determined by the expert.

Sign up for a consultation with an orthopedic traumatologist or (depending on the nature disease). Tell the doctor that you want to wear a brace. Clearly describe its purpose.

- If you need to stop pain syndromes, maybe you fit elastic belts. The absence of stiffeners gives more freedom and ease. This is perfect for everyday wear.

- If necessary, support the joints and soft tissues in the right position you will register more rigid model. The degree of fixation depends on the specific requirements. The doctor will determine how many plates and stiffeners required.

- If you have problems with the skin, this item should also be discussed with a specialist. It is advisable to consult a dermatologist. After inspecting it determines whether it is possible to wear a brace in your case.

Record all of the recommendations of doctors, not to forget the important parameters of a suitable model. This information will come in handy when shopping.

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Figure 23 - corrective products for the correction of scoliosis

The size of the orthosis

To the medical device properly fulfill its function, it must sit on the figure. To achieve this, heeding some yardsticks, using soft tailor centimeter. measuring point depends on the type of orthosis:

- dorsal (different parts of the spine) - chest circumference, waist and lower back;
- neck - circumference of the neck;

- knee - foot circumference at two levels: 15 cm above and below the center of the patella;
- shoulder - chest girth under the armpits, arm circumference of the shoulder;
- elbow - arm circumference in the elbow joint.



Recliner - the simplest design for the thoracic, which is prescribed for severe stoop, weakness of the muscles of the shoulder girdle, scoliosis. Shape of the product in the expanded form is similar to the sign of infinity. Such braces support the upper back, shoulders and the clavicle in the correct position.

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	<p>Thoracic spinal orthopedic corset - a more complex structure, which is the skeleton of a wide longitudinal strip on the back. From it are two straps passing under the armpits and collarbone breeders in hand. Products of this type are provided with stiffening ribs for a stronger fixation. They are at serious pathologies of the cervical and thoracic part of the back, as well as radicular syndrome.</p>
	<p>Lumbosacral belt, intended for the correction, the treatment and prevention of problems in the lower back.</p>
	<p>Thoracic lumbosacral corset that covers the entire back - this is a complex medical design and fixing the corrective nature. Wearing of the products shown in scoliosis first or second degree, kyphosis, osteoporosis and lumbar lordosis. To brace securely in the back, it has reinforcing ribs and plates sewn into a solid fabric.</p>

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	<p>Corsets for pregnant women - a separate group of products designed just for women to bear a child. They are the second and third trimester, when the size of the stomach increases significantly. Products in this category allows you to distribute the increased load on the spine, avoid skin stretch marks and ptosis of the internal organs. Sales have options as elastic Velcro and reinforced model with ribs for patients with spinal problems.</p>
---	---

Division units respectively function. Devices fall into Correcting (repositioned in a), the retaining, guiding, forming, replacement and combined.

	<p>Regulating (repositioned in a) are called the apparatus, contributing to reposition bone fragments: tightening or stretching them before installation in the correct position. These include aluminum wire bus with elastic rod, wire elastic braces, extraoral devices with the control lever apparatus for breeding jaw contractures and others.</p>
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	<p>By guiding devices advantageously includes a ramp, sliding joint which permits the jaw bone fragments specific direction.</p>
	<p>Apparatus (tires) holding the body parts (e.g., jaws) in a particular position, called the locking. These include smooth wire bracket extraoral apparatus for fixation of bone fragments maxillary intraoral and extraoral apparatus for fixation of bone fragments at lower jaw bone grafting et al.</p>
	<p>Called forming apparatus, the support being a plastic material (skin, mucous membrane) or creating a bed for the prosthesis in the postoperative period.</p>

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By substituting devices include replacing defective dentition, formed after tooth extraction, filling defects in the jaw, face parts, arose after the trauma operations. They are also called prostheses.



By combined include apparatuses having several purposes, such as fixation of bone fragments jaw and forming prosthetic bed or substitution jaw bone defect and simultaneously forming a skin graft.

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bandages

	<p>Bandage hernia. Used to prevent disease progression. Strapping allows hernia infringe. Constant use of this bandage will help avoid surgery.</p>
	<p>Of knee brace. It applied prophylactically trauma knee or joint instability, as well as damage and muscle tension.</p>
	<p>Ankle. It has a protective function. Protects joints when running or playing sports, as well as muscle injuries and other diseases.</p>

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	<p>Nalokotnye. Necessary to restore ligament sprains and contusions of the elbow.</p>
	<p>Wrist. Necessary to restore ligament sprains.</p>
	<p>Shoulder. Apply when suffered a dislocated shoulder, osteoarthritis, and other similar problems.</p>

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Neck. Use if I have a subluxation of neck injury, concussion.




These shoes must meet the following requirements:

- manufactured from high-quality natural materials;
- have a stable heel of 3-4 cm for female models and 1-1.5 cm - for men;
- High availability is required dense, but not traumatic backdrop with a vertical axis;
- the sole should be of medium hardness, light, non-slip;
- Shoes should fit perfectly on the fullness and size.

Special requirements for insoles in orthopedic footwear. They should have a thickened area podpyatochnuyu not wrinkle, absorb moisture, absorb the foot when walking. In the absence of orthopedic shoes, arch support can be set separately.

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	<p>Unloading. Advantages: soft support transverse and longitudinal arches of the foot, the load is reduced, eliminate pain, fatigue, swelling. Cons: Do not have a therapeutic effect.</p>
	<p>Prevention. The good news is that they are used to combat the signs of the cross and longitudinal flat 1, 2 degrees. Special shape, bends repeat exactly the anatomy of the foot. The bad news is that not help at an advanced stage of the disease.</p>
	<p>Diabetic. Advantages: different semi-hard or a soft base with grooves that reduce the burden on the foot. Products do not have a rigid elements, so do not injure the feet are recommended for diabetics and people with rheumatoid arthritis. Disadvantages: not to risk their own health, it is necessary to do custom insoles.</p>

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	<p>Massage. Pros: Focuses on pressure points during a walk. This removes puffiness and fatigue. Insoles relax muscles, restore the circulation. Cons: have no therapeutic properties.</p>
	<p>With arch support. These devices have an anatomical shape for a full arch support. The good news is that they are used to fight flat-footed, and other diseases. The bad news is that it is not too easy to use.</p>

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Baby. They are made of soft and hard materials feet enough support. Advantages: well-chosen model is not felt, does not cause discomfort, walk with them the child is much easier and more convenient. Recommended for kids with clubfoot, flatfoot, congenital foot defects. Disadvantages: there is a risk of buying substandard products.

Plants

proven manufacturers

The abundance of brands that produce medical orthoses, able to stall. In order not to be disappointed in buying, give preference to well-known companies. Their products are in great demand in Russia and abroad, and the new development receive only positive feedback.

- Orlett - German brand founded by Rehard Technologies GmbH. This is a world market leader in orthopedic products, because the range is really amazing. The manufacturer offers all possible types of orthoses, with several options for each joint and limb. Modern high-tech equipment, innovative research and development and use of quality materials to deliver the highest quality finished products.

- BAUERFEIND produces not only medical bandages and splints, but also compression stockings. Products of this German brand are very popular in Russia thanks to affordable prices and excellent design. Moreover, the company has repeatedly advocated a sponsor of the Olympics, providing its own products for athletes.

- REHBAND - a Swedish brand, part of the list of the world's leading ortho-market. This company

specializes in sports bandages and corsets. Most models are made of high-elastic materials that enhance comfort when worn.

- DonJoy - American orthoses premium. They have won worldwide popularity because of the unique development, allowing to solve highly specialized tasks. The product line contains not only soft and semi-rigid orthoses, but postoperative splints, corrective products and fasteners.

- Ortex - fairly low cost orthopedic products from Slovakia with excellent functionality. The lion's share of the assortment is adjustable hinges with orthoses.

- OPPO - another American brand, offering a large selection of corrective, preventive fixation and orthoses. Products of this brand are different in that their composition has a lot of different materials, which increases the possibility of individual selection.

- Otto Bock - the famous German manufacturer of orthopedic products of various kinds. In its portfolio are sure to find a model perfectly fits your needs. The fact that the company pays great attention to detail, creating a multifaceted orthoses designs.

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service regulations

To the effect of wearing it was positive, it is necessary to strictly adhere to the doctor's recommendations - orthopedics and producer. How to wear a medical orthosis correctly? Pay attention to the following points:

- **Duration of wearing.** This parameter is able to identify only a trained technician. The basis of the diagnosis and take the degree of development of the disease. Any initiative in this regard may lead to negative health effects.
- **Proper donning.** Fixing the desired degree of rigidity - the key to the effectiveness of wearing a corset or brace. To feel the correct tension, the first time put on the orthosis under the guidance of a specialist. The doctor will show how and in what order to fasten the straps and clips. Advise on the degree of fixation, with the correct settings. In the future, these instructions will be useful to you for the independent operation of the product.

- **Regular maintenance by the rules.** Since the brace is made of textile, over time it gets dirty. Usually flexible model can be run in the washing machine, and the other orthoses with reinforcing ribs and plates have to be washed by hand. The water should be cool, not hot 40 degrees. Use aggressive powders and other cleaning chemicals can not. You can use a mild soap. Dry the product in the straightened form, placing them on a horizontal surface. Make sure that was not there heating or radiators. The fact that the plastic parts can be deformed by heat.

Bracing

Bracing - this strap-lock for removing the foot from the shoe, special shoes with clubfoot. And it can be used only after the clubfoot has fully corrected manipulations and plaster bandages (Figure 12 - 17).

Clubfoot relapse up to 4 years of age against the backdrop of rapid growth is possible even after

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successful correction. To date, the brace - the most simple and reliable method of preventing relapse. Consistently observing usage patterns brace can prevent relapse in 90% of children. Wearing a brace, as a rule, does not prevent the development of the child. This convinced the parents, when a child learns to crawl and even stand up (depending on age). The task of parents - the right to wear the brace.

Bracing for clumsy: features of wearing and caring

Please note that the shoes with such a device - this is no ordinary walking shoes. Rigid and fixed base brace designed for therapeutic use. It does not allow the foot to move the usual way from heel to toe. sole materials are such that on some surfaces lead to slip boots. Therefore, wearing only shoes without the strap

will not provide a therapeutic effect. A child should always wear shoes with metal lath.

Fixators combined with the majority of car seats and strollers. Choosing a highchair, correlate its width to the width of locks, it was not necessary every time take smb. Shoes off before boarding a child in it.

Screws that shoes are attached to a metal bar, you need to check 2 times a month - sometimes it is necessary to tighten them. Remember! Small items of orthopedic shoes separate from the metal strap clamps are dangerous for the baby!

Clamps are made by different manufacturers. Are proven brace "Bear" ("Bear" also offers [orthopedic shoes](#)). Clips can also be manufactured according to individual orders (Figure).



Figure 12 - Bracing for deformity correction stop ditey after adjusting them to conduct surgery in a clinic M. Vavilov operation

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Figure 13 - a fragment Brace



Figure 14 - Correct use of the brace scheme

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Figure 15 - Features of use of the brace to correct various cases of clubfoot stop children



Figure 16 - Arrangement of clamps stop children in the brace

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Figure 17 - Detail of fixing the corrective product on the brace

What is intoing?

Intoing (from the English «in» - Inwardly, «toe» - toe) - is an English term, not having so short as analog in Russian language. In domestic medicine this phenomenon is often called the reduced forefoot (CSPs), in the people - "Clumsy" (not to be confused with the clubfoot).

If in a standing position to look at your feet from top to bottom, then most people will see that they are directed either straight ahead or slightly curved outwards. However, in some cases, the arch of the foot inward toward each other, and this phenomenon is called "intoing". This violation is very common among young children, and in most cases it is itself corrected on its own over time. Only a small percentage of children remains a problem and requires treatment.

What causes intoinga?

There are three main reasons intoinga in healthy children: given stop, the inner torsion tibia and femur excessive eversion.

What is a given stop?

stop Present - this curvature, which is best seen when viewed from the child's feet. This violation is noticeable even in infants, and it occurs in the womb because of the pressure on the foot of the fetus. At the same time, in 9 out of 10 children born to a given foot, as they grow older the problem solved itself.

What is the inner torsion shin?

Internal torso twisting tibia called the tibia, linking the knee and ankle. As a rule, parents are discovering the violation, when the child begins to walk. It is understood that a small torsion in infants is the norm, and in the first year of life it is usually equalized. However, in some cases, this alignment is not sufficient to ensure that the foot when walking facing forward or slightly outward. These children intoing persists up to 6-8 years, because it is before the age of the bones of the legs continue to be straightened.

What is excessive eversion of the femur?

Excessive inversion - is the internal femoral torsion. It is worth noting that all children are born with a mild form of the disorder, but it usually occurs between the ages of 2-4 years after the child begins to walk confidently. During early childhood, the violation may be exacerbated.

How is intoing?

intoinga Treatment depends on the cause of its occurrence.

The above stop

A doctor can teach you special massage to stretch the child's foot and its gradual straightening. If the bend is too strong or if the massage does not work, assigned superimposition on the foot brackets or bus.

Doctors are still arguing about the optimal age for laying orthopedic appliances, but still most of them converge in the opinion that the presence of uncorrected curvature of 4-6 months to start treatment

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should be at this age, and it must end even before as the child begins to walk confidently. If even after correcting the child's feet are slightly crooked, it will not prevent him to run and play, and in general this condition is not accompanied by painful sensations. Only a strong curvature can create problems with the selection of shoes, which is the main reason for the use of tires and staples.

In this case, the bracket and corrective shoes alone are ineffective. But there is a treatment option that combines the orthopedic rod with shoes, which together are putting pressure on the foot, causing it to straighten. The disadvantages of this method are the relatively high cost and the reluctance of children to wear pretty uncomfortable and bulky structure. That is why many doctors do not recommend to treat the inner torso tibia in young children. Firstly, most people eventually she corrected on its own. Second, even if this does not happen, the doctors and scientists still have not established any connection untreated torsion shin with the development of arthritis or the inability to run and jump.

In rare cases, the main problem is the appearance of the curvature. In this case, the solution is surgery in which the bones are cut and turned inside out, and the foot is straight. However, in practice such an operation was made only a very small number of people, and the possibility of its implementation should be very carefully and discussed in detail with your doctor.

Excessive eversion of the femur

As a rule, excessive eversion femur runs itself. Most children stop rectified by the time they reach 6-8 years of age. staples or orthopedic footwear is usually ineffective in fighting this cause intoinga, and only in very rare cases with very pronounced curvature child needs surgery. However, again, the surgery method is considered only in the most severe cases.

Conclusion.

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 production of shoe orthopedic technology means in the form of supplementary insoles and other supplementary devices can serve as an effective means to improve its preventive properties including for valgus plane of the 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.

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