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V.L. Gusyev *

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Short communication

Basics of Feet and Spine Correction

V.L. Gusyev *
President, Member of Pedorthic Association of Canada, Canada.

***Correspondence Author:** V.L. Gusyev, President, Member of Pedorthic Association of Canada, Canada.

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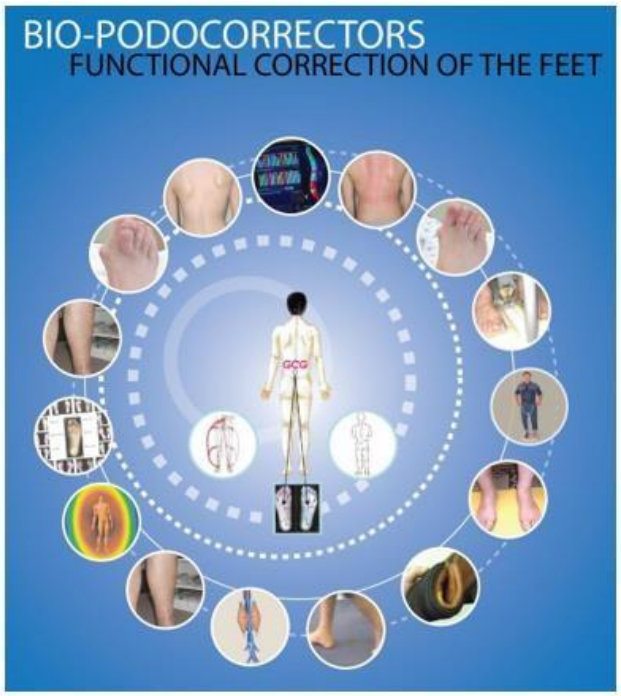
Abstract

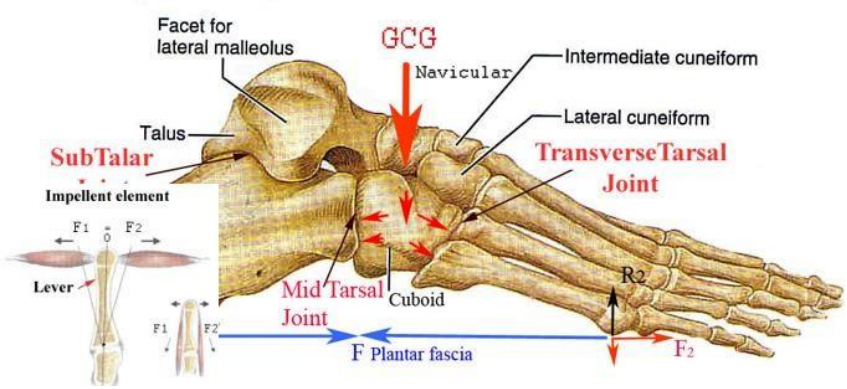
There is a lot of talk about flat feet, as well as about other types of deformations in the structures of the musculoskeletal skeleton of the body, but there is nothing essentially that could help eliminate the deformations. Over the past 50 years, the percentage of deformities of the feet and spine in the developed countries of America and Europe has grown from 8-19% to 65-89%.

Keywords: human biology; musculoskeletal skeleton; mechanical and thermal

Introduction



There is a lot of talk about flat feet, as well as about other types of deformations in the structures of the musculoskeletal skeleton of the body, but there is nothing essentially that could help eliminate the deformations. Over the past 50 years, the percentage of deformities of the feet and spine in the developed countries of America and Europe has grown from 8-19% to 65-89%. This is the result of training specialists with a narrow profile. Orthopedic doctors do not have knowledge in the field of biomechanics, sopromat, theoretical mechanics, which does not allow them to carry out a causal analysis, to determine the real causes leading to deformations. None of the doctors I interviewed could explain the reason for the diagnosis. The textbook on human biology lists only the following muscle functions: - motor; - protective (for example, protection of the abdominal cavity); - Formative (determines the shape of the body and the function of other systems, for example, respiratory); - energy (the conversion of chemical energy into mechanical and thermal).



At one time, Academician V.V. Parin (1969) said: muscle function is a determining factor in the level of metabolic processes in the body, on which the state of the bone, muscle and heart systems depends. The mistake of specialists involved in the correction of the musculoskeletal skeleton of the body today is that there is no understanding of such a relationship that, through the elimination of deformations, they must solve the problem of restoring the metabolism of body cells. For this, first of all, it is necessary to understand what deformations are, for what reason the joint has lowered, the joint, the arch of the foot or the spine curved. The specialist must understand the cause-effect relationship of the occurrence of deformations. To do this, you should know that any deformation is determined by the load and the ability of the system to compensate for it. In our case, this is muscle tone. A specialist should work with these characteristics when eliminating this or that displacement of the skeleton bone, to know how to balance forces in the system of paired muscles**.**

The load on the foot, its arches is determined by the position of the reduced GCG of the body relative to the support points of the feet, - the support triangle of the feet. The design of the skeleton of the body is an unstable system in which the GCG of the body is constantly shifting, oscillating about the vertical axis. These fluctuations are physiologically important for the body, supporting the contractile pump function of the muscles. With the displacement GCG of the body, with the fall of the body, all movements begin. Without leaning forward, you will not get up from the chair, do not stand on tiptoe, do not take a step. To perform any movement, it is necessary to overcome the forces of gravity. Therefore, the load on the arches of the feet during movement is calculated by the formula P = M (3-5) g, which is 30-50 times greater than body weight and amounts to several thousand kilograms. This load is compensated by musculoskeletal structures. When the action of forces on the arches of the feet stops, then the bones should take their neutral position. If the paired muscles did not return them to this neutral position, then this is a deformation. This means that lymph and blood circulation, biofeedback by muscle work were disturbed, and energy expenditures for keeping the body in balance increased. This today explains the rapid fatigue of people, the appearance of a diagnosis of fatigue syndrome. With poorly developed muscles, deformations turn into subluxations of joints and bone fractures.

When correcting feet, specialists do not bring the skeleton to a neutral position and do not even think about it, because they do not know how to do it. In addition to adjusting the arches with insoles, it is also necessary to restore the biomechanics of walking, reducing dynamic forces. In general, the correction of the feet should take into account the following:

- the position GCG of the body relative to the center of the supporting triangle of the feet. This is due to the presence of a functional and anatomical difference in the lengths of the legs;
- muscle tone. A low or high rise in the foot indicates this;

- the position of the calcaneus and the angle of the turn of the feet when walking.

All these parameters are parameters that reflect the tog or other type of deformity of the feet, but not the root cause of their occurrence and all others that arise in the structures of the skeleton, up to the cervical region. Subjectively assess the parameters of deformations in the patient's sitting or lying position, this is illiterate. It should only be performed while standing under load. For this, devices such as a podoscan and a hydraulic system from communicating vessels are used.

These devices should be in every orthopedic office, for specialists involved in deformations of the feet and spine, normalization of the work of the whole body, which is observed after the deformations are eliminated and the metabolism of the cells of the body is restored. Before talking about the errors due to which medicine is not able to eliminate the deformations of the feet and above the underlying skeleton structures, let's figure out how to do it right. Consider what shoes should be and why Chinese medicine claims that chronic diseases of the body are associated with foot deformities and wearing shoes. As a sedentary lifestyle affects the low oxygen content in the blood and that it accumulates in the muscles. We will understand why it is necessary to swaddle newborns in the first two months after birth. Let's understand why the subluxations on the first cervical vertebra Atlanta are associated with and what are the reasons for walking on fingers and hyperactivity in children. Understand the cause of cold feet and related diseases.

Functional correction of the musculoskeletal skeleton of the body is the basis of the therapy of any self-regulatory system.

Before considering the errors in diagnosing deformations in the structures of the skeleton: feet, joints of the legs and spine, it will be advisable to figure out what the approach should be when removing deformations. Let's forget everything that we have been taught. Indeed, the percentage of deformations of the feet and spine has reached levels of more than 90% today. Studying the anatomy of the feet, they talk only about the number of bones that make up its structure and nothing about the kinematics of their movement in the structures of the arches, about the function of the arches at different phases of walking, when the foot acquires certain properties. By nature, the inherent sequence of bone displacement in the arches when walking is the work of lymphatic and venous-muscular pumps that provide lymph circulation, blood flow to the heart. Medicine still cannot understand the mechanism of blood movement in the body, which is not the heart that provides the movement of liquid media in the body, 70-90% of which it consists. The role of the heart is the nutrition of the brain during wakefulness and, most importantly, sleep, when muscle activity is minimal. Do not forget that the work of these pumps, the oxygen content in the blood is associated with the work of muscles, with walking. The activity of people over the past 50 years has decreased by 200 times. For normal life, the body receives less than 500-750 kcal per day. Cells do not receive oxygen; decay products are poorly excreted, i.e. body cell metabolism has deteriorated significantly. Here is where to look for thecause of the increase in the percentage of diseases, both among the elderly and children. It does not matter what and how much a person ate, but what is ultimately delivered to the cells. Considering the work of lymphatic and venous-muscle pumps, it should be linked with movement, with muscle contraction, as a result of the displacement of the body's GCG relative to the vertical axis of its symmetry. These displacements, muscle contraction are controlled by the Central Nervous system through biological feedbacks.

In one plane, the load axis passes from the first cervical vertebra, this is the level of the position of the vestibular apparatus, and to the lumbar region. The axis passes behind the hip and in front of the knee joints, to the center of gravity of the supporting triangle of the feet. So, when the load passes the hip, knee and ankle joints, their bracing is ensured, stability of the whole body from falling forward or backward.

In the frontal plane, the body axis passes from the first cervical vertebra through the center of the spine to the sacrum. The sacrum rests on the iliac bones, with which it forms the iliac-sacral joints, forming a single block called the pelvis. The height of the position of the pelvis and with this the GCG of the body relative to the supporting surface is determined by the length of the legs. The left and right limbs are connected through the hip joints to the bones of the pelvis. With the difference in the lengths of the legs that each person has, the pelvis, and with it the sacrum, unfold at an angle to the vertical, and with this the entire spine and head with the vestibular apparatus. All these displacements are monitored by the vestibular apparatus and worked out by the central nervous system, correspondingly acting on the muscles of the back, spine, leading the head to the vertical.

The process of bringing the head to an upright position is the mechanism for the formation of the C-shaped and S-shaped spine, depending on the size of the anatomical difference in the length of the legs and the nature of the muscles. So we came to the understanding that the parameter determining the nature of the load on the arches of the feet and joints of the entire skeleton, up to the first cervical vertebra, is the difference in the lengths of the lower extremities and what is the tone of the muscles. Shortening of a limb is made up of the sum of two quantities: the anatomical and functional components. In order to determine the anatomical component, it is necessary first to eliminate all the components of functional shortening.

$$H = Na + Nf;$$

The components of functional shortening of the limb (Nf) should include:

- deformation of the supporting vaults (1,2,3). In the plane of coordinates XY, these will be: external longitudinal and transverse arches. Orthopedics does not deal with these arches, and all other types of deformations begin with them.

- pronation of the inner arch occurs for many reasons:

1. This is due to walking with the feet turned outward.

2. When turning the heel under a long limb. So, the foot shortens itself.

3.When the top of the outer arch sags. When the cuboid bone touches the supporting surface, then relative to it there is a torque of the forces, which unfolds, throws the inner arch relative to the supporting surface of the subtalar joint.

This is the mechanism of pronation, damping of the speed of transfer of the leg when it is placed on a support and the beginning of movement from another limb. Without knowing this, experts raise and bring an insole under the inner arch. So they deprive the foot of the ability to suppress the forces of inertia, and these blows perceive above the underlying skeleton structures: joints, spine and so on up to the brain. The foot and skeleton should extinguish inertial forces of the order of (5-7) g, to values that do not cause concussion, which does not exceed 0.5g.

Stages of correction of the arches of the feet

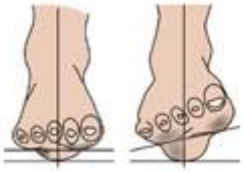
The main criteria that determine what and how to perform in the manufacture of orthopedic individual insoles are: - restoration of lymph and blood circulation in the body. To do this, perform the following operations and in a certain sequence.

The main task is to compensate and bring GCG the body to the CG of the supporting triangle of the feet. As we have already found out, for this it is necessary to eliminate the functional components of limb shortening. They, in turn, arise due to the existing anatomical difference in the lengths of the legs.

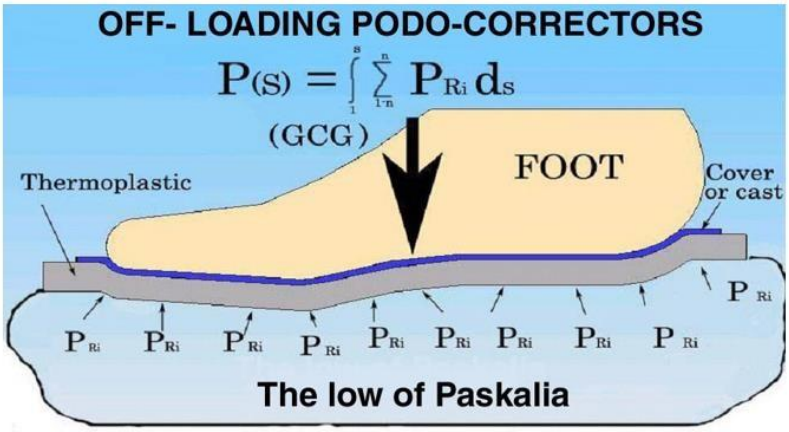
This difference is not determined in a standing position on the floor, when there are compensatory displacements in the structures of the skeleton. The picture shows that after each joint replacement operation, the right limb was defined as short. It was lengthened so much that due to a violation of the alignment of the knee joints, the woman could not get up from her chair. But standing on the hydraulic system the left leg turned out to be shorter by 4.5 cm. This difference is already visible at the stage of receiving foot prints, which correspond to the skeleton brought to the neutral position. The imprint shows all skeletal abnormalities to the level of the ankle joint. Such 3D prints also indicate the tone of the human muscles, the individual height of the heels that should be in the shoes.

Before taking foot prints, it is recommended to perform a 30-minute relaxation of the muscles of the spine so that it can straighten while standing on the hydraulic system.

Upon receipt of a positive fingerprint, it is not required to perform any operations, for example: pouring plaster models. At this stage, the task of manufacturing the insoles is to eliminate all the components introduced to the component of the functional component of the shortening:



- turn the calcaneus into a vertical position, placing the supporting surface under the heel parallel to the tangent to the support points of the first and fifth heads of the metatarsal bones. With such actions, the inner vault will independently rise and take its natural position.

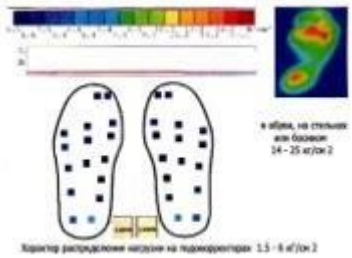


- give the external and transverse support vaults an arched shape.

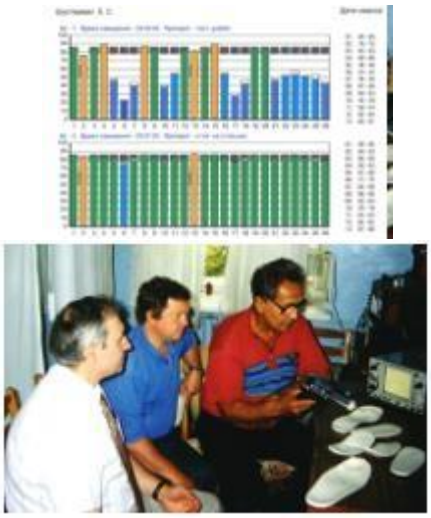
- by the magnitude of the deflection under the apex of the external arch and other signs, determine the muscle tone in order to select the material of the pilots that determine the cushioning properties of the insoles. Muscle cramps at night, cold feet, heartburn indicate muscle hyper tonicity. These are hollow feet, in which the skeleton is located above the level of the average neutral position. These are strong muscles that contract poorly and supply blood. Such people feel cold feet and hands, are very mobile and children begin to walk on their fingers.

A similar thing happens when walking in high heels, when the skeleton closes in a rigid lever, which ensures the execution of the jerk phase when walking or jumping. Rubber materials used as shock absorbers can work with compression up to 30% of the volume. This calculates the height of the pilots under the supporting vaults. Under the inner arch there should be a flat plate lying under the outer arch and supporting the scaphoid and talus from turning on the calcaneus. With a large weight of the patient and large degrees of compression, he will work as a rigid support, keep the arch motionless. So the contractile pump function of the feet, lymph and blood circulation in the body is disturbed, its delivery to the heart. Now, only when all these factors have been taken into account and eliminated by the insoles, we can begin to determine and compensate for the anatomical component of the shortening, which is the reduction GCG of the body's to the CG of the supporting triangle of the feet. Such an operation is possible only by the hydrostatic method and no other way. Having stood on the diaphragm of the communicating vessels, the length of the legs is compensated, and the spine takes an upright position.

To understand this, we will consider all the components of the method, which are based on knowledge of Pascal's law and communicating vessels, which were part of the high school physics course. The basis of this method can be the fact that deformations of the feet and above the underlying skeleton structures are the result of the displacement of the load from the vertical axis of loading. This displacement can be eliminated only in a standing position on the elastic diaphragms of the hydraulic system, where the body weight is compensated by Pascal forces equal to the mass of the body and directed from the bottom up. So these two forces bring the skeleton of the feet and spine to a neutral position. The body hangs on the diaphragms in a stable upright position. The pressure in the communicating vessels under each limb is equalized. One leg rises and the other falls, the pelvis and sacrum with the spine turn around and are brought upright. The prints show what the difference is in the lengths of the legs and what should be the height of the heels in casual shoes.



This stable position is the process of compensating for the difference in leg lengths, bringing GCG the body's to the CG of the supporting triangle of the feet. The load under each foot is evenly distributed over the surface of the soles. The specific pressure on the entire surface of the anatomically unloaded foot podocorrector is 3-5 times less in comparison with the support on the ground or orthopedic rigid insole. Unloading sub-correctors improve the capillary nutrition of the tissues of the soles, which is a decisive factor in the restoration of tissue trophism in diabetic angiopathy Patients immediately begin to walk without feeling pain. Trophy of tissues is alreadyrestored within a week, there is no need to amputate a limb. Work carried outunder the supervision of specialists of the Institute of Endocrinology and Orthopedics in the city of Kiev, noted such an effect as the normalization of blood sugar. At that time, mitochondria in muscle cells had not yet been discovered that they absorb blood glucose. The number of mitochondria in non-working muscles does not exceed 3-5 units. When performing physical exercises, their number can reach 10-20 thousand. Today there are advertisements for the treatment of diabetes in 20 days. While testing quality of correction of the feet and spine, we began to record how the energy characteristics of all body systems change and that it comes to normal after 7 days of walking on insoles. It was determined that this information is recorded by the insole material and it is important which materials and what color should be used in the insoles.



Physicist, member of the Ukrainian Academy of Sciences F.V. Kivva and doctor of medical sciences N.D. Kolbun confirmed the fixation of information from the body insoles. So they began to be called Bio-sub-proofreaders. Information on insoles has become another factor determining the rapid restoration of a self-regulating system, which is our body. Summing up all of the above, we can conclude that the functional correction of the feet and all the structures of the skeleton above the hydrostatic method is a means of restoring cell metabolism, normalizing the work of the whole organism. This means that the correction of the feet cannot be subjective and must be carried out under the control of objective control systems.

Two methods for making insoles

Having figured out how the correction of the feet, the foundation of our skeleton should be performed, we can already consciously compare how today the correction of feet is carried out throughout the world and how this should be carried out in practice. The presented figure in the center shows the technological operations that we determined how necessary to perform when stop correction. Green arrows indicate that they are running, while red arrows are not running. The left column shows the existing technologies, and the right one is described by us. As you can see, in the list of operations performed in modern insoles there is not a single action that is included in the concept of real correction. Here is the answer why insoles do not solve the problem of foot deformations, why the percentage of deformations is so high in countries where insole manufacturing services are widespread. They are not made by doctors; they are made by people who have not seen the patient. And the foot prints made without taking into account the load, i.e., taking into account the position GCG of the body, each of us has a difference in leg lengths. There is no control over the quality of the insoles, the correctness of the correction performed, since the criteria are not formulated that determine why correction is needed, that these actions should be aimed at ensuring the stability of the body, removing the skeleton in a neutral position, normalizing lymph and blood circulation in the body. Any of these values can be selected for control, and its parameters will indicate that the other two mutually related to it are reduced to normal.