PROGRESS IN ORTHOPEDIC SCIENCE, 2021
VOL 7, NO. 1, PAGE 1 – 3
DOI: doi.org/10.47363/POS/2021(7)142

MINI REVIEW

Open Access

Basics of Foot Correction

Gusyev Valentyn

President Member of Pedorthic Association of Canada

ARTICLE HISTORY

Received Feb 16, 2021
Accepted Feb 22, 2021
Published Feb 26,2021

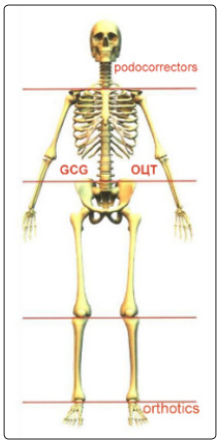
Statistics of recent years show that the existing methods of making orthopedic insoles do not solve the problems of correcting feet, leg joints and spine. Indeed, without this, the tasks of restoring the pumping function of muscles, - the metabolism of body cells, cannot be solved. Over the past 60 years, foot deformities have been observed not in 14-19%, but in 85-95% of the inhabitants of the developed countries. The question naturally arises, what is the reason?

It becomes clear from the analysis of two methods of making orthopedic insoles. This is a traditionally used worldwide technique and method of functional hydrostatic correction of the elements of the musculoskeletal system, aimed at restoring lymph and blood circulation in the body, at stabilizing the work of all structures of the musculoskeletal frame of the body. This formulation of the problem is determined by human physiology, indicating that skeletal muscles are responsible for cell metabolism, and deformations are the cause of disturbances in the work of the self-regulated system. Although individual insoles are called orthopedic, they have never been referred to as medical products, not considered from the standpoint of their influence on lymph and blood circulation, the state of the body.

Analyzing the traditional method of making insoles, we see that it does not take into account the state of the muscles and the nature of the load - the position of the body's GCG. This applies not only to deformities of the feet, but also to the underlying structures of the skeleton resting on them, to the joints of the legs and the spine.

Foot prints are taken while sitting or lying down. The sequence of operations shown in the figure also indicates that the main support vaults are not corrected in the traditional method. These are the longitudinal outer and transverse vaults. The inner vault is deprived of the ability to extinguish the speed of the transfer of the leg; a solid insole is placed under it. It follows from this that there is no understanding of the biomechanics of the feet. The main task of removing the skeleton to a neutral position is not being solved, and therefore restoring the pumping function of the muscles. In 1971 my father developed a method of hydrostatic foot correction. Later it was developed, for which in 1986 I was awarded the bronze medal of the All-Union Exhibition in Moscow and the diploma of the European organization TACIS.

Contact Gusyev Valentyn ✉ gusyevval@hotmail.com President Member of Pedorthic Association of Canada.

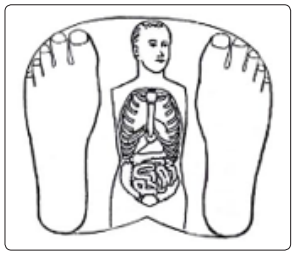


In the figure, green arrows indicate the operations that must be performed when correcting the arches of the feet, making podocorrectors, which is not the case in traditional technologies. It should be noted that orthotix insoles do not solve any of the above tasks for correcting the feet and the entire musculoskeletal system, they harm the body. I see the reason in the narrow specialization of specialists, ignorance of the biomechanics of the feet. They do not know that the main vaults are the outer longitudinal and transverse vaults. All types of foot deformities begin with them. The inner high vault is deprived of the function to extinguish the speed of the leg transfer, which corresponds to flat feet.

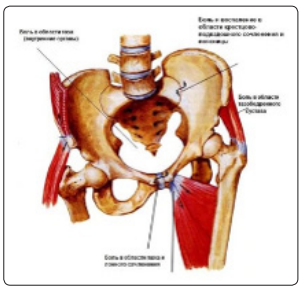
When correcting the feet, the task is not set to bring the arches to a neutral position. This cannot be done without compensating for the difference in leg lengths, eliminating the skewing of the pelvis, from which the formation of scoliotic posture begins. The difference in limb lengths that each person has should be taken into account when obtaining prints. But, as already noted, they are removed while lying or sitting. That is, without taking into account the position of the body GCG, the load on the arches of the feet. All this indicates that there is no understanding of what deformation is, and therefore it is not formulated what needs to be done to eliminate it.

Deformation is an imbalance in the balance of forces in a group of paired muscles, when the bones of the skeleton are displaced from the neutral position and do not return to their original state upon termination of the load. The wording will also be correct: **deformation is a violation of the pumping function of the muscles.**

The wording will also be correct: deformation is a violation of the pumping function of the muscles. Today, more than 80% of the population constantly feel cold feet and hands, there is an increase in almost all diseases in the body. Improperly made shoes and insoles are the reason. There are also no methods for diagnosing the condition of the feet, which would be the basis for the manufacture and quality control of insoles, the effect of correction on the state of the body.

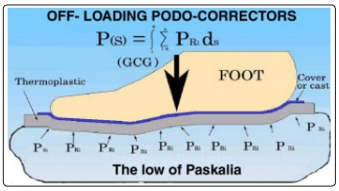


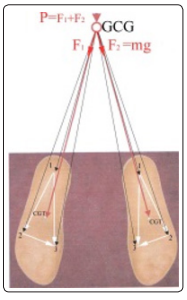
This does not allow us to correctly assess the actions of the doctor. Otherwise, the specialist would not work up to the level of the ankle joint, but with the structures of the entire skeleton. Therefore, there is no understanding that diagnostics, imprinting and making insoles should be components of a single manufacturing process. It should also include actions to control their quality, influence on the condition of the feet, the spine and even the entire body. The shape of plaster prints from deformed feet should not be the basis for making insoles on them. Their profile does not correspond to the neutral position of the skeleton. They were obtained without taking into account the position of the body GCG and the anatomical difference in leg lengths. Sitting or lying prints cannot be used. As a result, the support points on the insoles and in the shoes do not correspond to the support points of the foot skeleton, which leads to even greater deformations.



It is possible to enumerate for a long time what they do wrong, that correcting the feet and the spine, these are interrelated processes. The result of correct correction of the musculoskeletal framework will normalize the metabolism of cells throughout the body. If a specialist correcting the foot works up to the level of the ankle joint, then during hydrostatic correction all structures of the musculoskeletal system are covered, including the head to the level of the position of the vestibular system. It is he who signals the tilt of the head and is involved in bringing it to the vertical. This is how the C-shaped or S-shaped spine is formed. On the basis of all that has been said, we will give as axioms the main tasks that should be solved when eliminating deformities:

Restoration of the contractile, pumping function of skeletal muscles



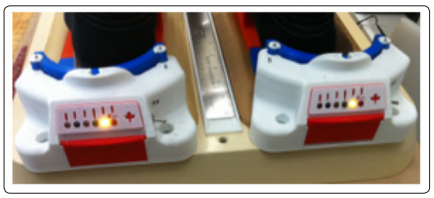


This should be the main task of orthopedics, which cannot be resolved with medication or surgery. No means can put the skeleton of the feet in a neutral position. It reflects the physiological essence of muscle work and the vital activity of the body. In order to do this, it is necessary to compensate for the forces acting on the foot and other joints of the skeleton. This is achieved by the hydrostatic method in a standing position on the diaphragms of the communicating vessels. So the pressure on the feet from top to bottom and from bottom to top is the same, and the difference in leg lengths is compensated by communicating vessels.

Bringing the GCG of the body to the CGT of the support triangle of the feet

Lies in the basis of an e qual distribution of body weight on both limbs, feet, as well as giving the body a stable vertical position. This will restore the kinematics of movement of all joints, avoid wear of the cartilaginous layer on the rubbing surfaces of the bones, the development of arthrosis and arthritis. These actions should also be considered from the position of eliminating the skew of the pelvis and sacrum, from which the curvature of the spine begins.

Compensation of the anatomical difference in limb lengths



This is one of the key conditions for performing the first two tasks: bringing the skeleton into a neutral position and ensuring vertical stability of the body, i.e. restoration of the pumping function of the muscles. It is possible to determine the anatomical component of shortening only after elimination of the moments of forces acting on the joints when they deviate from the vertical axis of symmetry of the body. And in this case, a hydraulic system with a specially designed device is used. On it are insoles that eliminate functional displacements of the skeleton, becoming on which the anatomical component of shortening is measured and compensated, the spine is brought to a vertical position.

All these three tasks are interconnected and reflect one problem, referred to as the deformation of the musculoskeletal frame. The key point of this relationship is the understanding that it is impossible to restore the pumping function of the muscles without bringing the skeleton to a neutral position, which in turn is achieved by bringing the body GCG to the center of the support triangle of the feet by compensating for the difference in leg lengths.

In other words, we can say: correction is the fulfillment of all three conditions. In them, the main components of deformations are the load, the point of its application, i.e. position of the body GCG, which is perceived and compensated by the muscles. These are the parameters that are considered when designing and calculating parts of artificial limb prostheses, which include orthopedic insoles.

Orthopedic insoles should help restore the functionality of the arches of the feet - the pumping function of the muscles

When a specialist is engaged in foot correction and takes into account only the state of the skeletal structures up to the level of the ankle joint, then he cannot fulfill these conditions. He cannot take into account the nature of the existing deformities of the spine, displacement of the body GCG. Therefore, more than one foot, a limb will always be loaded. Deformities, varicose veins, swelling, etc. will begin to develop on it earlier. In such a situation, the task of correcting the spine, muscle relaxation (to restore the structure of muscle cells), comes to the fore. The process of foot correction should begin with it, and only then make foot prints in a standing position on the hydraulic system. The insoles compensate for the functional component of limb shortening. By standing on the insoles installed on the device, you can determine and compensate for the anatomical difference in leg lengths.

Spinal deformity is associated with the slope of the sacrum at the ilio-sacral joints of the pelvis. Their position depends on the anatomical and functional difference in the length of the legs. The tilt of the pelvis causes a displacement of the GCG of the body, tilt of the head to the side, to which the vestibular apparatus and the central nervous system react. The distortion of the shape of the birth opening today is the reason for such a high percentage of birth injuries in newborns. We note that over 85% of people have muscle hypertonicity and are hyper-active. To give the head a vertical position and the body stability, the spine is twisted, which on a flat X-ray image looks like an S or C-shape.

Experts measure the angles on a flat image of a volumetric twisted spine, which, in fact, is not correct. It is impossible to eliminate the deformity of the spine when the body GCG is displaced. It is impossible to correct the spine without compensating for the difference in leg lengths - the functional and anatomical components of limb shortening. We need other methods and other training of specialists. Not an orthopedist, but a specialist with knowledge of biomechanics, who understands the kinematics of the vaults, the structure of muscle cells and methods for their restoration, is able to do all this in a single interconnected process. Today, many young people are offered spinal surgery. But a week later, after muscle relaxation and compensation for the difference in leg lengths, the spine returned to normal. After such actions, the work of internal organs is also normalized. In patients, acne on the face and body disappears, there is no constipation or heartburn, the veins in the legs will hide, blood sugar has returned to normal, and everything that characterizes the self-regulating function of the body. All this is controlled during the manufacture of insoles, the correctness of the correction. These results and the fact that orthopedic correction is the basis of any therapy are confirmed by the data of therapists and computer testing of the functional state of the body. This allows us to say that the correction process can be assessed, and this excludes any subjectivity in the actions of specialists. The method of hydrostatic correction of feet includes all processes, starting with diagnostics, making insoles and quality control of the correction, their effect on the state of the body.