

# The Role of Orthotic Therapy in Balancing the Body and Achieving Structural & Functional Harmony

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Imagine sitting on the edge of a peaceful pond, observing the wonderful reflections dancing on the surface of the mirror blue waters. A gentle breeze blows by a tree and releases a tender leaf that quietly floats and lightly touches the surface of the water. The immediate effects are noticeable. The mirror-like finish of the water has been transformed to concentric oscillating waves and ripples. Like that pond, which reacted to the presence of the leaf, the human body is constantly in a dynamic state, acting and reacting to the environment that it is surrounded by.

The human neuromusculoskeletal structure is a link in the biomechanical kinetic chain in which movement at one area influences movement in other areas. A similar view is also shared in traditional Chinese medicine (TCM); the human body is interconnected through meridians in which the influence of one affects the other. In TCM, meridians are the "powerlines" that govern the flow of *qi*. Without the meridians in which the *qi* flows, the anatomical structure has no physiological function. An intricacy exists in the relationship of structure and function of the human body. In the TCM theory, in order to achieve balance in the meridians, harmony must be established through structure (yin) and function (yang).

Orthotic therapy is instrumental in correcting structural imbalances that exist in the body's pedal foundation. The feet are the foundation of our neuromusculoskeletal system and play a major influence on the integrity and functionality of the rest of the system. The feet comprise one quarter of the body's bones and are susceptible to structural defects such as plastic deformation of connective tissues and malalignment of bones, leading to excessive pronation or supination.<sup>1,2,3</sup>[PB]

These defects can have repercussions throughout the neuromusculoskeletal system. Since the structural component of the human body exists in the biomechanical kinetic chain, the movement of one joint influences the movement at other joints in the chain.<sup>4</sup> The biomechanical kinetic chain begins from the feet, progresses to the ankle, tibia, knee, femur, hip joints and pelvis, and travels through the spine. When imbalance or structural deficiency are present, the kinematic chain becomes vulnerable to destructive torques, bending and shearing stresses.<sup>5,6,7</sup>

Postural instability is a direct result of imbalance in the body's pedal foundation. The interrelationship of musculoskeletal structure dictates that uncontrolled movement in one area will have a negative impact on other links in the biomechanical kinematic chain. Pedal imbalance can have a significant impact on a patient's treatment outcome. Orthotic therapy helps overcome and correct biomechanical disturbances in the body resulting from deviations in foot structure or function. The goal of orthotic

therapy is to control, not restrict, motion within the pedal structure. By controlling foot motion and position, orthotics encourage normalization of joint interaction along the kinetic chain.

Orthotics are known to help improve balance and proprioception, enhance muscle function, reduce leg length inequality, lower extremity overuse injury, and help patients with sacroiliac syndrome, heel spurs, low back pain, patellofemoral pain syndrome and a host of other conditions. A new study in the *Journal of Manipulative and Physiological Therapeutics* attempted to determine if orthotics could create positive structural skeletal changes in the foot. The results showed that the custom made orthotics not only improved biomechanical support, but were also comfortable and effective.<sup>8</sup>[PB]

Orthotic therapy is most effective when the prescribed level of support correlates to the level of physical stress created by each patient's condition, physiology and lifestyle. Factors such as weight, activity level and musculoskeletal integrity indicate whether light, moderate or intense orthotic support is necessary. Since several factors must be addressed when implementing orthotic therapy, custom-fitted orthotics will be more effective in treating specific conditions than pre-manufactured orthotics.

### References

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