

LETTERS TO THE EDITOR

To the Editor:

In the January, *Journal of Rehabilitation Research and Development* 36(1), 1999 issue (page VI), Paul F. Ziegelhofer made some interesting observations and comments, based on his personal experience as an ankle disarticulation amputee. In the fourth paragraph, he made the personal observation of terminal residual limb pain when he wears a rigid plastic prosthetic socket. He went on to make the statement that his pain was "...a result of compression friction and not proper fitting of the prosthesis." He then made several observations and recommendations for prosthetic fitting and prescription, again based on his personal experience.

Clinical observation allows us to ask scientific questions. Mr. Ziegelhofer's explanation of the etiology is an excellent example of the method of clinical observation that I too frequently observed during my training. Mr. Ziegelhofer's observations are simply that, observations. In order to explain clinical observation, one must scientifically ask a question, study the question using the scientific method, and develop data to support a conclusion.

Articles in both the January and April, 1999 issues of the *Journal* address this topic. Vannah and associates, in the January issue, and Zheng and associates, in the April issue, both address the soft tissue envelope. They are both very reasonable steps toward answering the questions posed in Mr. Ziegelhofer's observations. Load transfer is a complex engineering process. The load is transferred from the body to the ground (or vice versa) through the soft tissue envelope. Depending on the amputation level and quality of residual limb soft tissue envelope/interface, that biomechanical load is transferred via a combination of direct (endbearing) and indirect (total contact) loading. Theoretically, in direct load transfer, the soft tissue envelope acts as a cushion absorbing pressure loading. With indirect load transfer, the load takes on more of a shear component.

This is the real scientific question posed by both Mr. Ziegelhofer and the two scientific articles. The transfer of load in a prosthetic socket is a combination of pressure and shear. Measuring these forces has been virtually impossible in the past. These two scientific studies are the first steps in scientifically addressing the real clinical problems addressed by Mr. Ziegelhofer. I would hope that we support the approach taken by the two scientific researchers, and not use the observational method of Mr. Ziegelhofer.

I hope that this letter doesn't simply ramble. I abhor the anecdotal approach to medicine. Prosthetics and orthotics has advanced from an apprentice discipline to a scientific discipline. The anecdotal method simply impedes scientific progress.

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To the Editor:

This is to bring to your attention that the reference to Syme's level amputation as ankle disarticulation in the article by Marcia W. Legro, PhD, et. al., "Issues of importance reported by persons with lower limb amputations and prostheses," *JRRD* 36(3), 1999 pp. 155-164, is incorrect. A Syme's amputation is a transmalleolar amputation.

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Author's Response

To the Editor:

In a descriptive paper such as "Issues of Importance Reported by Persons with Lower Limb Amputations and Prostheses," (MW Legro et. al., *JRRD* 1999;36(3):155-164), the various amputation levels were categorized into four basic groups to enable comparison and analysis of the data. In each of the four groups, the surgical nuance of technique did vary in bone level, flap design, and soft tissue stabilization. It was not the goal, or even feasible to separate out the numerous different surgical styles that were placed into these four groups.

To answer your specific question on the terminology of Syme Amputation and Ankle Disarticulation, I would refer back to James Syme's original description: "The disarticulation being then readily completed, the malleolar projections were removed by means of cutting pliers" (1). I would agree that surgeons have debated the optimum level of bone transection, and degree of malleolar trimming, but even F. William Wagner, Jr., MD, writes of "The Syme Ankle Disarticulation" in his more recent chapters (2).

The latest surgical teaching is to teach a disarticulation and then trimming of the malleoli to intentionally leave the subchondral bone on the tibia for improved weight bearing.

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REFERENCES

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2. Wagner FW, Jr. The Syme ankle disarticulation. In: Bowker J, editor. *Atlas of limb prosthetics, surgical, prosthetic, and rehabilitation principles*. St. Louis: Moseby; 1992. Chapter 17.