DEPARTMENT OF VETERANS AFFAIRS
Medical Center
Coatesville PA 19320

April 17, 2001

In Reply Refer To:

The Foot Institute
2308 96th St.
Edmonton, Alberta
Canada T6N-1J8

To the podiatric phsycicians of the Foot Institute,

Re: Accomcodative vs. Functional Orthotics

I was recently asked about the appropriateness of using rigid orthotics for patients with diabetes. In response I am enclosing two journal articles and another research abstract that documents the successful use of rigid orthotics in diabetics and to show that their use is not contraindicated and may actually in some cases be the best treatment choice. It should be noted that there are also some other articles that have appeared showing that rigid AFO devices have been successfully utilized in diabetics, and if you would like copies of those, please let me know. Also please note that I can not find any research that would show that a well prescribed rigid orthotic is contraindicated for diabetics.

One big problem is that the term "rigid orthotic" is not well defined. Does the term refer to surface hardness or does it refer to device flexibility? These are very different meanings. For example, I can take steel (a material with a very hard surface) and utilize it to fabricate a very flexible spring. (I bet your car doesn't use plastazote springs). Likewise I can take a material like poron (a material with a very soft surface) and by making it thick enough make a bed to step on that is almost rock hard with no flexibility. Unfortunately most people pick up a material and if they can easily compress it with their hand or easily bend it with their hand they call it a soft material and if it resists such maneuvers they call it a rigid material. Most of these people have never tested the material compresibility nor its flexibility in the dynamic state that it is made to function in.

Now the question is, "Do diabetics need soft materials or hard materials under their feet?" I do not believe that any blanket statement can be made about diabetics. I would be as foolish to make such a statement as your internist would be in deciding whether all diabetics should be treated with insulin or with oral hypoglycemics. The simple answer is that each person is different, with different needs. That's why various diabetics need various medications and also why various diabetics need various types of orthotics. Some diabetics are more prone to ulcers, others more prone to instability, others more prone to Charcot joints, etc. And just as an internist may get a diabetic into trouble by prescribing the wrong medication and by not monitoring the patient, so a podiatrist may get a diabetic into touble by prescribing the wrong orthotic and by not not monitoring the results of that orthotic.

So what are the indications for a Root type of device made from a plastic material? Any time there is a desire to control the joint motions in the diabetic there is a need for plastic materials. If there is little to no desire to control the joint motions of the diabetic foot, then no plastic material is needed. A normal person will feel very comfortable on a plastic material if they have adequate soft tissue covering the bony structure of the foot (i.e. normal muscle mass and subcutaneous fat pads) and if the orthotic has the correct shape and prescription. Likewise diabetics will easily tolerate a plastic material against the skin if they have normal muscle mass and normal subcutaneous fat pads and the orthotic has the correct shape and prescription. If the patient has a loss of muscle mass or has compromised soft tissue biomechanics, then additional materials may be added between the plastic and the skin to make-up for the

identified deficits. There are many different materials for the physician to choose from supplement soft tissue deficits including polyurethane, EVA, plastazote, poron, etc.

So what is the all the fuss that some people make about plastics under the foot? I would make the following observations:

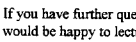
1) Plastics have more of a potential to create pressure points than non-plastic materials. The reason for a plastic orthotic being more likely to produce a pressure point is because the shape and prescription have to be much more accurate than orthotics made out of cushion materials. Small inaccuracies in the shape of a plastic device or in the prescriptive balance of the device can produce devastating results whereas small inaccuracies in the shape or balance of a device made from only cushioning materials have little potential to produce ill effects on a patient, even if the shape and balance of the device are grossly inaccurate. Thus the practices of the physician prescribing the device must be evaluated in deciding whether a practitioner should be using rigid devices. Physicians with little knowledge about the biomechanics of the foot or physicians who do not pay great detail to the small angular relationships between the foot segments should not be utilizing rigid devices. Likewise physicians who do not have the time and interest in very closely monitoring their devices should not be using rigid devices. I liken the use of rigid devices in diabetics to the use of aminogglycosides for treating infections. You certainly would not allow a nurse practitioner to utilize these potent medications. And you certainly would not utilize these medications without a very tight monitoring process. A rigid orthotic should be treated, then, with the same respect and care as a highly potent prescription medication.

2) Plastic materials can be used in a manner that a total contact cast can be used in treating the foot. The total contact cast - which is much more rigid than almost all rigid orthotics - immobilizes all the joints of the foot and evenly distributes the pressure under the bottom of the foot. The same type of effects can be accomplished by using rigid orthotic devices. On the other hand soft materials only transfer weight to other parts of the foot when they are compressed, and there is usually much less ability by these materials to actually transfer weight off of an abnormal pressure area. In addition, the weight transferring ability of these materials is quickly lost - usually within a few weeks. In the United States, the government allows for replacement of insoles every six months. My experience indicates that for diabetics at risk of ulceration, this is far beyond the life expectancy of plastazote and other soft materials. When treating a Charcot joint, it is my opinion and experience that rigid orthotics are much more effective than soft orthotics. I have seen Charcot joints heal by using rigid orthotics, whereas with soft orthotics the collapsed joint will continue to move and sublux. I would therefore state that the use of soft orthotics is actually contraindicated when treating the patient with a Charcot joint.

In summary, I treat a great number of diabetics in my current practice. Over 30% of our patients are diabetic. We have no problem is prescribing rigid orthotics for cases of controlling pressure areas (including those that are induced by Charcot joints) and for controlling abnormal pronation of the patient. In those patients with poor circulation, friable skin, loss of fat pad and loss of muscle mass, additional soft tissue supplementation is utilized on top of the rigid device. Certainly not all of our patients are treated like this as there are a number of goals that may need to be addressed and sometimes the primary goals are more inexpensively treated with soft materials and methods.

If you have further questions, please feel free to contact me. You may share this letter with those whom you desire. I would be happy to lecture, discuss or debate these principles with any one at any time.

Sincerely,



Robert D. Phillips, D.P.M.
Director, Primary Podiatric Medical Residency

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