

TREATING THE WHOLE PERSON

The Importance of Orthotics in the Care of Amputee Patients

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When a person is missing a limb or more than one limb, he or she will likely have numerous additional problems, including back, knee and hip pain, as a result of that missing limb and/or the use or misuse of an artificial limb (prosthesis). All of these needs must be addressed if that patient is to return to life successfully.

As a physical therapist, a prosthetist, and an orthotist, I am directly involved in all of these aspects of treatment. Physical therapy can certainly help the patient avoid or deal with many of these problems. And in many cases, the use of an orthotic device, such as a brace or splint, would also be beneficial.

What Is an Orthosis?

An orthosis is an external appliance that is applied to the body to restrict or assist motion. It can also be used to

support weak muscles, to prevent or correct injuries or abnormalities, or to transfer load from one part of the body to another.

Orthoses (the plural of orthosis) are commonly referred to as braces, splints or supports and include a wide variety of appliances. Generally, a brace is rigid, and a support is soft or semi-rigid. A splint is a temporary device used to prevent motion at a particular joint. Modern terminology describes orthoses by the joints they span; therefore, a foot orthosis is an FO; an ankle foot orthosis is an AFO; a knee ankle foot orthosis is a KAFO; etc.

Orthoses can be custom-fabricated like prostheses or prefabricated “off the shelf” devices; which type is used will depend on the patient’s individual need.

When Is an Orthosis Needed in Prosthetic Treatment?

The goal of rehabilitation is to restore individuals to their former capacity or to the highest level of function possible. Therefore, replacing a missing limb or its function with a prosthesis should be only part of the overall treatment of the amputee patient. Total treatment should also include proper assessment, physical therapy, training, and, in many cases, orthoses.

Unfortunately, though the importance of a prosthesis for restoring function after amputation is usually obvious, the need for an orthosis is often not as obvious. An orthosis may, however, help enhance the patient’s use of a prosthesis by treating the patient’s secondary conditions that are separate from the amputation or that were caused by the use or misuse of his or her prosthesis.

Vascular disease, for example, is a major cause of amputation and is often associated with diabetes. As a result of diabetes, patients may also develop neuropathy, which causes reduced sensation and muscle weakness. Left untreated, this neuropathy can limit the patient’s ability to function. When a person has only one leg amputated as a result of diabetes or vascular disease, his or her other leg may have preexisting problems as well and might benefit from orthotic treatment.

In addition, even if the amputee’s remaining leg is healthy at the time of amputation, it will have to work harder to compensate for his or her amputated leg, which can lead to undue damage to it as well.

Another common cause of limited

function among amputees is their physical condition at the time of prosthetic fitting. They might have range of motion problems or muscle weakness from disuse or prior bad habits. Unfortunately, physical therapy for long-term deficiencies might not be sufficient alone to restore the patients' function.

Physical deficiencies can also result from the use of a prosthesis. A prosthesis is a mechanical system that must include the proper fit, alignment and components for maximal function and safety. The system must enable the individual to function as normally as possible so that he or she will avoid dependence on his or her remaining sound limb. If the prosthetic system has any deficiencies, it can affect the body adversely and, over time, limit function.

In these cases, orthotic intervention is essential. Unfortunately, the use of an orthosis is too often an afterthought or a last resort treatment only when a problem reaches an advanced stage. Ideally, we should provide preemptive orthotic treatment from the beginning to prevent these problems or at least to minimize them as much as possible.

Feet, Ankles and Knees

The vast majority of single-leg amputees would benefit from a foot orthosis to help preserve the function of their remaining leg. For best results, a treatment plan should address both potential and existing problems.

When weakness and/or limited motion is present at the ankle or knee, an AFO may be needed to support weak muscles and restrict unwanted motion. Even in the absence of weakness or limited motion, however, tremendous pressures are being exerted on the residual foot and ankle. A foot orthosis may be necessary to minimize the effect of these pressures and to maintain proper alignment.

Overuse Injuries

The overuse of assistive devices, such as crutches, walkers and wheelchairs, can also cause problems that may



require orthotic treatment. Carpal tunnel syndrome of the wrist, tendonitis of the elbow, and rotator cuff problems of the shoulder are examples of repetitive-use syndromes.

Physical therapy in conjunction with the appropriate orthosis can be helpful. A wrist orthosis (WO) that supports the wrist and limits motion is effective in treating carpal tunnel syndrome, and a simple elbow strap that applies pressure to the muscle and tendon that are causing pain will provide some relief for tendonitis.

Back Pain

Low back pain is prevalent in the general population and is exacerbated by an inadequate prosthesis and/or poor physical condition. Again, the use of corsets, binders or other types of orthotic supports should be incorporated into physical therapy treatment. It is, however, important to consider all of the factors that contribute to the problem in order to find the solution. Just as a prosthesis is not a total solution in itself, neither is an orthosis. Total treatment of the whole person is always indicated.

Lifestyle Injuries

Finally, a variety of injuries can result from a very active lifestyle. Modern advances in prostheses have enabled amputees to engage in activities that were not possible many years ago. As a result, injuries resulting from accidents, athletic activities, or aggressive exercise will require treatment that may include orthoses.

As always, prevention is the best cure. A postural evaluation and preactivity screening are advisable. Preventive treatment that includes a foot orthosis may also help prevent potential injuries. Again, this should be part of a total treatment plan that includes physical conditioning and the proper equipment, including the prosthesis. The proper footwear can also contribute to the prevention or correction of deficiencies and should also be considered as orthoses.

What Does This All Mean to Me?

The most important aspect of total treatment is the active participation of the patient. Understanding your options in treatment is the critical first step. This requires information and education.

You should investigate all of your options, and orthotics and prosthetics should not be considered exclusive of each other. Along with prosthetic technology, proper fit, and physical conditioning, orthotics may be essential to your rehabilitation process. If you feel that you might benefit from orthotic treatment, let your prosthetist or physical therapist know. Don't wait for him or her to suggest it. It's your job to make sure that your healthcare team treats the whole person and doesn't just replace your missing limb. ■



About the Author

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