

# POLIO NETWORK NEWS

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## Sixth International Post-Polio and Independent Living Conference

### The Battle with Bracing, Part II: Choosing an Orthotist

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**A**n orthotist specializes in orthopedic appliances, also known as orthoses. Orthotists study anatomy and physiology, mechanics of movement (kinesiology), as well as fabrication of orthoses and prostheses.

Prosthetics deal with replacing missing limbs, while orthotics provide bracing. A certified orthotist can suggest how to best duplicate mechanically what is functionally missing anatomically.

**Choose a board certified orthotist.** In 1948 the American board of certification required that orthotists be certified. Anyone already practicing was automatically certified under the "grandfather clause." Those new in the field were required to take a two-hour written quiz. Today an orthotist must have a bachelor's degree and several years of work experience prior to his or her exams. The exams consist of a day of written, a day of oral, and a couple of days of practical fabrication. In the future a master's degree will be required. There is now a mandatory continuing education program requirement.

A certified orthotist, or a CO, also referred to as a practitioner, deals directly with patients and assists physicians in evaluating orthotic needs. Orthotists are not doctors and cannot diagnose or prescribe, so have a prescription in hand when approaching an orthotist about an appliance.

Another form of certification is that of the certified technician. Technicians do not see patients but fabricate braces.

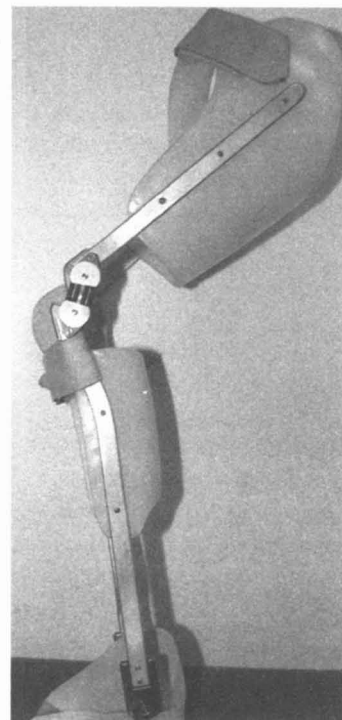
**Images of orthotists vary.** Initial impressions are very important. Individuals who have never worn braces can have a variety of anxieties or expectations. One should expect a facility with examination rooms allowing for privacy. Also expect to see parallel bars in the walking room for initial gait evaluations if lower extremity problems are present. Parallel bars are not used when evaluating upper extremity or spinal difficulties.

Orthotists should perform muscle tests, range of motion, and gait analysis to confirm a prescription. A muscle test determines muscle strength and what loca-

tions are having problems — ankle, knee, hip, even upper extremity. Range of motion detects joint deformities. Gait analysis is done both before and after lower extremity bracing.

An orthotist should explain what the options are and discuss the types of materials available to fabricate the orthoses. The approximate weight of the different approaches should also be discussed. It needs to be determined whether weight and/or strength is the priority.

There are lightweight, sturdy plastics such as polypropylenes or polyethylenes. Some braces are made out of exotic materials such as epoxies and graphite with or without metal bars for reinforcement. They can be any color of the rainbow, which surprisingly can present individuals with additional anxiety. Depending on the need and the physical limitation, metal materials such as aluminum, steel, stainless, or titanium are available as well as different cosmetic approaches, leathers, and velcro closures.



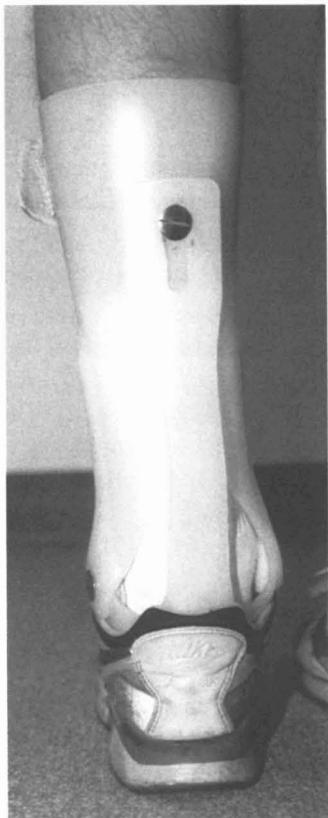
*A free motion brace with an offset knee joint with roller bearings and a rubber band type extension assist mechanism. The brace accelerates the lower shin portion forward extending the knee during swing phase of gait.*

### Different diagnoses require different designs.

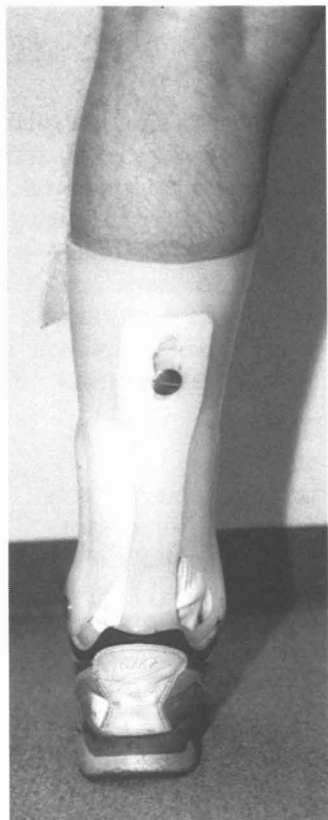
For example, the needs of a person with a spinal cord injury as opposed to a sports injury differ tremendously from the needs of an individual who is post-polio.

An individual with a low level spinal cord injury needs to have flail extremities stabilized and aligned to bal-

ance the body when standing with locked knees and locked ankles. SCI individuals have to see where their body is in space because they have no proprioception. That is, there is no ability to know where the body is in space when eyes are shut or while looking away from the extremities. The bracing goals are simple: Lock up all the joints.



*A plastic floor reaction brace which stabilizes the knee (without crossing the knee) and picks up the foot via a spring action. Note position of screw in each channel in each photo.*



A sports-related injury is usually an isolated injury on an otherwise intact body. Individuals need the injured area protected from re-injury while continuing with their usual activities. Sports bracing leverage is too short for polio survivors' flail extremities, and the limbs will not tolerate the circumferential restrictions that usually accompany the sports brace.

An athlete works out three to four times a week, resting in between days to prevent burnout or getting fatigued. During this resting period they go about their activities of daily living (ADL). Polio survivors need to recognize that ADLs for them may really be EDLs — exercise of daily living. A prescribed or a "ritual" exercise will be unnecessary for a polio survivor whose energy is depleted from "doing hurdles" over the

telephone cord in a carpeted area. The challenge for the orthotist is to recognize the functional needs of the polio survivor just as the needs of an athlete are recognized.

Orthotists need to be aware that post-polio individuals have been overcompensating with every step or movement. During my internship some years ago at Rancho Los Amigos Hospital, I also doubled as a professional patient for the benefit of orthotists in training in gait analysis. As I walked back and forth in front of the class without my braces, the instructor noted the control of my hip, knee, and ankle joints totally void of any muscle power and commented, "If you had that kind of control and regained all your muscles, you would be greater than Nuryev." Polio survivors proprioception is intact and heightened and that makes us different from all other diagnoses.

**Consider follow-up and finances.** An orthotist should appreciate the value of a six-month follow-up appointment. I mentioned this at the '87 G.I.N.I. conference, and at the '89 conference, a gentleman told me that he showed up for a six-month follow-up with his orthotist and was greeted with, "What are you doing here? There's nothing broke."

Brace joints need resquaring and lubricating; straps and rivets need checking. Joint bushings and bearings should be changed prior to a failure which can create financial and time burdens. One does not wait until the engine blows to change the oil. Our bodies change and braces need to be adjusted.

An orthotist should discuss the financial aspects of bracing so there will be no surprises at the time of delivery. A well-trained orthotist can put technique, material, and design to the test and keep polio survivors functionally active. □

#### RELATED RESOURCES

American Orthotic and Prosthetic Association, 1650 King St., Suite 500, Alexandria, VA 22314 (703/836-7118).

Northwestern University's Prosthetics Research Laboratory and Rehabilitation Engineering Research Program phone help line: 312/908-8565; e-mail: reiu@nwu.edu; web site => <http://www.repoc.nwu.edu/>

*The Whole Crutch and Wheelchair Catalog* compiled by Thomas Fetterman, Inc., P.O. Box 174, Southampton, PA 18966-4514 (215/355-6941).

*House of Canes and Walking Sticks*, 767 Old Onion Mountain Rd., Wilderville, OR 97543 (800/458-5920). Call or write for a catalog with extensive collection of shafts made of walnut, oak, ebony, birch, lucite, covered with fabric; handles and knobs made of sterling silver, silver plated, brass, etc.