MPI MUILENBURG PROSTHETICS INC.

Tech Update

Prosthetic Feet Offer Options for Varying Lifestyles

Muilenburg Prosthetics Inc. has built its reputation on providing prostheses for patients at all activity levels and varying lifestyles. Of course, an essential component of lower limb prosthetics is the foot – actually a combination of foot, ankle and pylon.

Choices in feet have expanded over the years from the basic SACH (solid ankle cushion heel) foot for walking to energy-storing feet for higher activity levels to multiaxis feet, which bend side to side and rotate for stability on uneven surfaces. Materials such as thermal plastics, carbon fiber, and composites result in feet that are lighter and stronger. New features also offer more control as well as comfort, reduce users' fatigue and help them function at a higher level. The patient has the option of leaving the componentry exposed or having a cosmetic covering.

Advancing technology provides today's prosthetic foot much of the same functionality as the biological foot. Feet can be selected to closely fit a person's activity level, occupational requirements, and sports and recreational pursuits.

While there is a foot for seemingly every amputee, budgetary considerations sometimes come into play. Costs and insurance coverage can vary depending on the type of prosthesis and its function level. Medicare uses functional K levels as a descriptor when a physician prescribes a prosthetic foot, knee, or even shock absorber.

Medicare Functional K Levels

K0: The patient does not have the ability or potential to ambulate or transfer safely with or without assistance and a prosthesis does not enhance his/her quality of life or mobility.

K1: The patient has the ability or potential to use a prosthesis for transfers or ambulation on level surfaces at fixed cadence. This is typical of the limited and unlimited, household ambulatory patients.

K2: The patient has the ability or potential for ambulation with the ability to traverse low-level environmental barriers, such as curbs, stairs, or uneven surfaces. This is typical of limited community ambulatory patients.

K3: The patient has the ability or potential for ambulation with variable cadence. Typical of the community ambulatory patient who has the ability to traverse most environmental barriers or who may have vocational, therapeutic, or exercise activity that demands prosthetic utilization beyond simple locomotion.

K4: The patient has the ability or potential for prosthetic ambulation that exceeds basic ambulation skills, exhibiting high impact, stress, or energy levels. This is typical of the prosthetic demands of the child, active adult, or athlete.

Selecting the appropriate foot

Although the choices for prosthetic foot componentry are many, factors such as general health, height and weight, level of amputation, and the length and shape of the residual limb are considerations.

A comfortable, good-fitting socket will complement the prosthesis providing good suspension and stability in stance phase under varying forms of terrain. Options are best discussed with a certified prosthetist, who is qualified to assist in making the patient-specific choice.

Fortunately, there are many manufacturers offering a variety of feet, so a prosthetist and patient will have little trouble finding one to fit the user's particular needs. While all options are not listed here, some foot choices for patients include:

Otto Bock Axtion® – The Axtion 1E56 foot is designed for active K3 and above patients who enjoy demanding activities that involve running and jumping such as basketball, tennis and softball, and other recreational sports. The Axtion is the only foot in its class to deliver an extremely low profile (2- 1/8 inches), appropriate for Symes amputation patients. The carbon-fiber foot incorporates ultra-lightweight materials in a pylon design to distribute the weight proximally. The S-style pylon allows for greater flexion for a more natural gait. It can accommodate patients who weigh up to 275 pounds.

Otto Bock Trias+ - The Trias+ offers the high functionality of carbon fiber feet specifically designed for moderate walkers. With a design concept modeled from the natural human foot, the Trias+ not only looks great, but most importantly, provides exceptional walking function - easy rollover to reduce

continued on back

Muilenburg Prosthetics Inc.
3900 La Branch
Houston, TX 77004

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MPI MUILENBURG PROSTHETICS INC.

PHONE: 713-524-3949 TOLL FREE: 866-524-394 FAX: 713-524-3915
WEB SITE: www.mpihouston.com
OFFICE HOURS: 7:30 am to 5:30 pm, Monday through Thursday • 8 am to Noon, Friday

effort and conserve energy, improved gait symmetry, and a reduction of excessive forces on the contralateral limb. The foot offers a secure, controlled action while improving amputee confidence and the ability to vary cadence. The superior gait characteristics of the Trias+ are a direct result of the unique dual spring elements incorporated into its design.

Freedom Innovations Renegade – Freedom Innovations' patented Z shape technology offers high shock absorption along with greater energy return and forward stride motion, providing a smooth gait regardless of the wearer's speed.

Because of the foot's angular design, energy is returned to all key areas of the leg, providing optimum cushioning of the residual limb, and also the highest possible level of tibial progression. The foot can be used for amputees at any speed or activity level and is suitable for everyday use.

The Renegade LP offers the same features and benefits as the standard profile Renegade, but in a lower profile foot for amputees with decreased clearance due to a long residual limb.

BioQuest Prosthetics PerfectStride II – The PerfectStride II foot system for K3 and above amputees closely replicates normal human foot and ankle function by allowing patients to conserve, store, and release energy. Three innovative components – the carbon graphite foot keel, ankle coupler and titanium calf shank – work synergistically to mechanically accept the downward force that occurs when the heel meets the ground and transfer these forces into forward motion. The PerfectStride II enhances mobility with improved propulsion power, increased gait velocity, better balance, and enables a more natural walk with less effort.

Ossur Talux® – The Talux has been designed to provide fluid, natural walking motion on a variety of terrains for amputees of low to moderate activity. It's modeled after the human foot and delivers range of motion and rotational movement along with energy return to relieve fatigue. Components include a full-length toe lever, a patented CarbonX Active Shell, and a J-shaped pylon, all of which contribute to additional energy released and returned with each step. It can be used for transtibial or transfemoral users with a weight range up to 325 pounds.

College Park TruStep® – The TruStep is designed to accommodate uneven terrain with the incorporation of multiple joints and elastomeric bumpers with the body of the foot system. For K3 patients, it combines virtually the same vertical motion, rotation and stability found in the anatomical foot. Its split-toe design provides up to one-half inch of independent toe flex during normal use.

College Park TruPer® for pediatric patients – This foot is designed for children, but with multi-axial ability and dynamic response, providing Grown Up Function for Kids™ during their formative years. It features adjustable Stride Control™ to customize children's gait and its design protects the residual limb and reduces fatigue. Plus, a sandal toe design allows a variety of shoe selection.

For more information on the proper selection of prosthetic feet or the services Muilenburg Prosthetics Inc. offer, call (713) 524-3949 or visit www.mpihouston.com.