Prosthetic Feet

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There are more than 50 models of prosthetic feet available today. Some are designed for special tasks such as walking, dancing, cycling, golfing, swimming, snow skiing or running. Many are waterproof and made of lightweight materials such as plastic, metal alloys and carbon-fiber composites.

Prosthetic feet can be basic (unmoving), articulated (moving in one or more directions), or dynamic-response (storing and returning energy when walking, giving a sense of “pushing off,” much like the human foot). Today’s prosthetic feet may have toe and heel springs to allow more ankle movement and adjustable heel heights, and to absorb shock.

There is no single foot that is perfect for every amputee. You and your doctor or prosthetist should choose a prosthetic foot based on your
amputation level (how high up the leg your amputation is), age, weight, foot size, activity level, and job needs. Here are some facts to know:

**Basic Prosthetic Feet**

There are two types of basic prosthetic feet: SACH (Solid Ankle Cushioned Heel) and elastic keel.

**The SACH** is the simpler of the two. It is rigid and cannot bend. It has a rubber heel wedge that compresses under the user’s weight, allowing a little ankle movement early in the stance phase of walking (at the beginning of a step). It provides stability, but little lateral movement, in mid-stance (when walking). The SACH comes in several heel heights so it can be worn with different types of shoes.

**Elastic keel feet** are a little more flexible than SACH feet. They allow the front part of the foot to adjust to varied walking conditions but stay stiff and stable while standing or walking.

Both of these basic types of prosthetic feet:

- have no hinged parts, last a long time, and need little repair
• cost less than articulated prosthetic feet
• are made of foam rubber and shaped to look like a human foot
• are cushioned but absorb and return less of the energy of walking than
dynamic-response feet
• are designed for people who do a limited amount of walking at a
constant speed
• are often used as an amputee’s first prosthesis and sometimes later
replaced by a more advanced type of prosthetic foot.

Articulated Prosthetic Feet

There are two types of articulated feet: single-axis and multi-axis. Both
allow motion in one or more planes, much like the movement of a human
foot.

Single-axis feet:

• have an ankle joint that allows the foot to
move up and down, which adds knee
stability
• are often used by people with higher levels of amputation (from the knee to the hip)
• reduce the effort needed to control a prosthesis and keep the knee from buckling
• add weight to the prosthesis, need periodic repair and cost a little more than most basic feet
• are often used by people who need stability.

**Multi-axis feet:**

• are similar to single-axis feet in terms of weight, need for repair, and cost
• move up and down as well as side to side to conform to uneven surfaces better than single-axis feet
• have ankle motion, which absorbs some of the stress of walking, protecting a person’s skin and reducing wear and tear on the prosthesis
• are often used by hikers, golfers, dancers and others who need a lot of foot movement.
Dynamic-response feet:

- store and release energy during the walking cycle
- give a sense of push-off, a more normal range of motion and balanced gait
- may have a split-toe design to add stability
- may lessen the impact on the heel of the person’s other foot
- are so comfortable and responsive that amputees might increase their level of activity
- are responsive and good for active amputees who vary their walking speed, change direction quickly, or walk long distances.

Transcribed from *Prosthetic Feet*

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