

Polycentric prosthetic knee joint

Country of origin | United States of America

Health problem addressed

Around 9.5 million people with an above-knee amputation living in low and middle income countries need a prosthesis to regain mobility for livelihood, employment and social integration. Most of the amputations are due to injuries, especially road traffic crashes, diabetes, and other health conditions. Modern above-knee prosthesis are prohibitively expensive, especially due to the cost of the knee joint, which is the most complex component of an above-knee prosthesis.



Product description

It is a polycentric prosthetic knee joint, which mimics the movement of a normal knee joint while walking. At the same time, it provides stability during the weight-bearing phase to ensure the person can walk with their artificial limb without falling.

Product functionality

A prosthetic knee joint is the connector between below and above knee prosthetic components to provide knee movement like a normal knee. It usually gets attached to a modular component or a pylon at the lower end which ultimately connects to a prosthetic foot. On the other end, it connects to a prosthetic socket again through a modular attachment.

Developer's claims of products benefits

Prosthetic clinics in the developing world typically recycle used donated prosthetic knees or use locally made single-axis knees. Donated knees are cost prohibitive to maintain and perform poorly in rugged environments. Single-axis knees are unstable and can buckle, especially when walking on uneven surfaces. The polycentric prosthetic knee joint provides increased stability for uneven and unpaved terrain, withstands high usage by using an oil-filled nylon polymer which self lubricates with use, it can be used in humid and wet environments and it is low cost. It provides 165° range of motion at the knee, which is critical for low and middle income countries, especially for kneeling, squatting, biking and agricultural work.

Development stage

The knee has been fit on over 4,600 patients, primarily in India. In 2013, the latest version of the product was tested to ISO 10328 - Prosthetics structural testing of lower-limb prostheses.

Future work and challenges

Successful outcomes depend on availability of trained prosthetists who can fabricate a custom socket to fit over the patient's residual limb. Scaling is currently limited to areas with established prosthetic clinics capable of providing a proper fitting.

Use and maintenance

User: Self-use

Training: Instructions for use comes with the product, fitting training is required for prosthetists

Maintenance: Not required

Environment of use

Settings: Rural, urban settings, at home

Requirements: A trained prosthetist to fit the product

Product specifications

Dimensions (mm): 60 x 80 x 140

Weight (kg): 0.68

Consumables: None

Life time (years): 5

Retail price (USD): 80

List price (USD): 80

Other features: Single-use, portable

Year of commercialization: 2008

Currently sold in: India