

## DESCRIPTION

More than 100 different prosthetic knee designs are currently available. The choice of the most appropriate design will depend on the patient's underlying activity level. For example, the requirements of a prosthetic knee in an elderly, largely homebound individual will be quite different than a younger active person. Prosthetic knees also vary in their ability to alter the cadence of the gait, or the ability to walk on rough or uneven surfaces. In contrast to more simple designs, which are designed to function optimally at one walking cadence, fluid and hydraulic-controlled devices are designed to allow the amputee to vary their walking speed by matching the movement of the shin portion of the prosthesis to the movement of the upper leg. For example, the rate at which the knee flexes after "toe-off" and then extends before the heel strike depends in part on the mechanical characteristics of the prosthetic knee joint. If the resistance to flexion and extension of the joint does not vary with gait speed, the prosthetic knee extends too quickly or too slowly relative to the heel strike if the cadence is altered. When properly controlled, hydraulic or pneumatic swing phase controls allow the amputee to set a pace from very slow to a race walking pace. Hydraulic prostheses are heavier than other options and require gait training; for these reasons these prostheses are generally prescribed for athletic or fit individuals. Other design features include multiple centers of rotation, referred to as "polycentric knees." The mechanical complexity of these devices allows engineers to optimize selected stance and swing phase features.

Most recently microprocessor-controlled prosthetic knees have become available, including the Intelligent Prosthesis (Blatchford, United Kingdom), the Adaptive (Endolite, England), the Rheo (Ossur, Iceland) and the C-Leg® (Otto Bock Orthopedic Industry, Minneapolis, MN ). The C-Leg® was cleared for marketing in 1999 through the 510(k) process of the U.S. Food and Drug Administration (FDA, K991590). These devices are equipped with a sensor that detects when the knee is in full extension and adjusts the swing phase automatically, permitting a more natural walking pattern of varying speeds. For example, the prosthetist can specify several different optimal adjustments that the computer later selects and applies according to the pace of ambulation.

With the exception of the Intelligent Prosthesis, these devices use microprocessor control in both the swing and stance phases of gait. By improving stance control, they may provide increased safety, stability, and function; for example, the sensors are designed to recognize a stumble and stiffen the knee, thus avoiding a fall. Other potential benefits of microprocessor-controlled knee prostheses are improved ability to navigate stairs, slopes, and uneven terrain, and reduction in energy expenditure and concentration required for ambulation.

## POLICY

A microprocessor-controlled knee may be considered **medically necessary** in amputees who meet the following requirements:

- Demonstrated need for long distance ambulation at variable rates (use of the limb in the home or for basic community ambulation is not sufficient to justify provision of the computerized limb over standard limb applications) OR demonstrated patient need for regular ambulation on uneven terrain or for regular use on stairs (use of the limb for limited stair climbing in the home or employment environment is not sufficient evidence for prescription of this device over standard prosthetic application); AND
- Physical ability, including adequate cardiovascular and pulmonary reserve, for ambulation at faster than normal walking speed; AND
- Adequate cognitive ability to master use and care requirements for the technology.

A microprocessor-controlled knee is considered **not medically necessary** in individuals who do not meet these criteria.

## POLICY EXCEPTIONS

None

## POLICY GUIDELINES

Decisions about the potential benefits of microprocessor-knees involve multiple factors including activity levels as well as the patient's physical and cognitive ability. A patient's need for daily ambulation of at least 400 continuous yards, daily and frequent ambulation at variable cadence or on uneven terrain (e.g., gravel, grass, curbs), and daily and frequent use of ramps and/or stairs (especially stair descent) should be considered as part of the decision. Typically, daily and frequent need of two or more of these activities would be needed to show benefit.

For patients in whom the potential benefits of the microprocessor knees are uncertain, patients may first be fitted with standard prosthesis to determine their level of function with the standard device.

The coverage guidelines outlined in the Medical Policy Manual should not be used in lieu of the Member's specific benefit plan language.

# POLICY HISTORY

7/27/2006: Approved by Medical Policy Advisory Committee (MPAC)

7/20/2007: Policy reviewed, description updated. Policy statement revised; microprocessor-controlled knee prosthesis changed from investigational to may be considered medically necessary in amputees who meet criteria as outlined in policy. Non-covered codes table removed. Covered codes table added. HCPCS L5856, L5857, and L5858 moved to covered. ICD-9 codes 897.2-897.7 and V43.65 added

11/15/2007: Revised policy approved by MPAC

## SOURCE(S)

Blue Cross Blue Shield Association Policy # 1.01.25

## CODE REFERENCE

This is not intended to be a comprehensive list of codes. Some codes may be variable, and coverage will be based on the clinical indication for the service.

### Covered Codes

Code Number	Description
<b>CPT-4</b>	
<b>ICD-9 Procedure</b>	
<b>ICD-9 Diagnosis</b>	
897.2, 897.3, 897.4, 897.5, 897.6, 897.7	Traumatic amputation of leg(s); code range for above the knee amputation(s) (added 7-20-2007)
V43.65	Organ or tissue replaced by other means; knee (added 7-20-2007)
<b>HCPCS</b>	
L5856	Addition to lower extremity prosthesis, endoskeletal knee-shin system, microprocessor control feature, swing and stance phase, includes electronic sensor(s), any type (moved to covered 7-20-2007)

L5857	Addition to lower extremity prosthesis, endoskeletal knee-shin system, microprocessor control feature, swing phase only, includes electronic sensor(s), any type (moved to covered 7-20-2007)
L5858	Addition to lower extremity prosthesis, endoskeletal knee skin system, microprocessor control feature, stance phase only, includes electronic sensor(s), any type (moved to covered 7-20-2007)

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