Medical Coverage Policy | Microprocessor-Controlled Prostheses for the Lower Limb

EFFECTIVE DATE: 01|01|2023
POLICY LAST REVIEWED: 04|02|2025

OVERVIEW

Microprocessor-controlled prostheses use feedback from sensors to adjust joint movement on a real-time as-needed basis. Active joint control is intended to improve safety and function, particularly for patients who can maneuver on uneven terrain and with variable gait.

MEDICAL CRITERIA

Medicare Advantage Plans and Commercial Products

The medical criteria below is only applicable for the following HCPCS code:

- K1014 (for dates of service up to and including 12/31/2023)
- L5615 (for dates of service on or after 1/1/2024)

For all other microprocessor-controlled prostheses for the lower limb HCPCS codes (L5856, L5857, L5858 & L5973), please use the online tool for participating providers. See the Related Policies section.

A microprocessor-controlled knee may be considered medically necessary in individuals with transfemoral amputation 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

Amputees should be evaluated by an independent, qualified professional to determine the most appropriate prosthetic components and control mechanism. A trial period may be indicated to evaluate the tolerability and efficacy of the prosthesis in a real-life setting. Decisions about the potential benefits of microprocessor knees involve multiple factors including activity levels and 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 (eg, 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, the daily and frequent need of 2 or more of these activities would be needed to show benefit.

Individual Selection and Identification

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

A. Contraindications for the use of the microprocessor knee should include the following:
   - Any condition that prevents socket fitting, such as a complicated wound or intractable pain which precludes socket wear
   - Inability to tolerate the weight of the prosthesis

- Medicare level K0-no ability or potential to ambulate or transfer
- Medicare level K1-limited ability to transfer or ambulate on level ground at fixed cadence
- Medicare level K2-limited community ambulator who does not have the cardiovascular reserve, strength, and balance to improve stability in stance to permit increased independence, less risk of falls, and potential to advance to a less restrictive walking device
- Inability to use swing and stance features of the knee unit
- Poor balance or ataxia that limits ambulation
- Significant hip flexion contracture (>20°)
- Significant deformity of remaining limb that would impair the ability to stride
- Limited cardiovascular and/or pulmonary reserve or profound weakness
- Limited cognitive ability to understand gait sequencing or care requirements
- Long-distance or competitive running
- Falls outside of recommended weight or height guidelines of the manufacturer
- Specific environmental factors such as excessive moisture or dust, or inability to charge the prosthesis
- Extremely rural conditions where maintenance ability is limited.

B. Indications for the use of the microprocessor knee should include the following:
   - Adequate cardiovascular and pulmonary reserve to ambulate at variable cadence
   - Adequate strength and balance in stride to activate the knee unit
   - Should not exceed the weight or height restrictions of the device
   - Adequate cognitive ability to master technology and gait requirements of the device
   - Hemi-pelvectomy through knee-disarticulation level of amputation, including bilateral; lower-extremity amputees are candidates if they meet functional criteria as listed
   - The individual is an active walker and requires a device that reduces energy consumption to permit longer distances with less fatigue
   - Daily activities or job tasks that do not permit full focus of concentration on knee control and stability-such as uneven terrain, ramps, curbs, stairs, repetitive lifting, and/or carrying
   - Medicare level K2-limited community ambulator, but only if improved stability in stance permits increased independence, less risk of falls, and potential to advance to a less restrictive walking device, and the individual has the cardiovascular reserve, strength, and balance to use the prosthesis. The microprocessor enables fine-tuning and adjustment of the hydraulic mechanism to accommodate the unique motor skills and demands of the functional level K2 ambulator.
   - Medicare level K3-unlimited community ambulator
   - Medicare level K4-active adult athlete who needs to function as a K3 level in daily activities
   - Potential to lessen back pain by providing more secure stance control, using less muscle control to keep the knee stable
   - Potential to unload and decrease stress on remaining limb
   - Potential to return to an active lifestyle.

C. Physical and Functional Fitting Criteria for New Amputees:
   - New amputees may be considered if they meet certain criteria as outlined above
   - Premorbid and current functional assessment important determinant
   - Requires stable wound and ability to fit the socket
   - Immediate postoperative fit is possible
   - Must have potential to return to an active lifestyle

POLICY STATEMENT

Medicare Advantage Plans and Commercial Products

A microprocessor-controlled knee in individuals with transfemoral amputation is considered medically necessary when the criteria above are met.

A powered knee is considered not covered for Medicare Advantage Plans and not medically necessary for Commercial Products as the evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

COVERAGE

Benefits may vary between groups and contracts. Please refer to the appropriate Benefit Booklet, Evidence of Coverage or Subscriber Agreement for applicable not medically necessary/not covered benefits/coverage.

BACKGROUND

Lower-Extremity Prosthetics

More than 100 different prosthetic ankle-foot and knee designs are currently available. The choice of the most appropriate design may depend on the patient's underlying activity level. For example, the requirements of a prosthetic knee in elderly, largely homebound individual will differ from those of a younger, active person. Key elements of prosthetic knee design involve providing stability during both the stance and swing phase of the gait. Prosthetic knees 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 prostheses, which are designed to function optimally at 1 walking cadence, fluid and hydraulic-controlled devices are designed to allow amputees 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 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 prosthetist to set a pace adjusted to the individual amputee, 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 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.

Regulatory Status

According to the manufacturers, microprocessor-controlled prostheses are considered a class I device by the FDA and are exempt from 510(k) requirements. This classification does not require submission of clinical data regarding efficacy but only notification of FDA prior to marketing. FDA product codes: ISW, KFX.

For individuals who have a transfemoral amputation who receive a prosthesis with a microprocessor-controlled knee, the evidence includes a number of within-subject comparisons of microprocessor-controlled knees versus non-microprocessor-controlled knee joints and systematic reviews of these studies. Relevant outcomes are functional outcomes, health status measures, and quality of life. For K3- and K4-level amputees, studies have shown an objective improvement in function on some outcome measures, particularly for hill and ramp descent, and strong patient preference for microprocessor-controlled prosthetic knees. Benefits include a more normal gait, increased stability, and a decrease in falls. The evidence in Medicare level K2 ambulators suggests that a prosthesis with stance control only can improve activities that require balance and improve walking in this population. For these reasons, a microprocessor-controlled knee may provide incremental benefit for these individuals. The potential to achieve a higher functional level with a microprocessor-controlled knee includes having the appropriate physical and cognitive ability to use the advanced technology. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have a transfemoral amputation who receive a prosthesis with a powered knee, the evidence includes no data. Relevant outcomes are functional outcomes, health status measures, and quality of life. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

CODING

Medicare Advantage Plans and Commercial Products

The following HCPCS code(s) is medically necessary for Medicare Advantage Plans and Commercial Products when the medical criteria above has been met:

L5615 Addition, endoskeletal knee-shin system, 4 bar linkage or multiaxial, fluid swing and stance phase control (New Code Effective 1/1/2024. For Dates of Service prior to 1/1/2024, K1014 must be used)

The following HCPCS code(s) are not covered for Medicare Advantage Plans and not medically necessary for Commercial Products:

L5827 Endoskeletal knee-shin system, single axis, electromechanical swing and stance phase control, with or without shock absorption and stance extension damping (New Code Effective 4/1/2025)

RELATED POLICIES

Prior Authorization via Web-Based Tool for Durable Medical Equipment (DME)

PUBLISHED

Provider Update, June 2025
Provider Update, June 2024
Provider Update, May 2023
Provider Update, November 2022

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