Myoelectric Upper Limb Prostheses

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<th>Type:</th>
<th>Policy Specific Section:</th>
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<tbody>
<tr>
<td>Medical Necessity/Not Medical Necessity</td>
<td>Durable Medical Equipment</td>
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<tr>
<th>Original Policy Date:</th>
<th>Effective Date:</th>
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<tr>
<td>April 2, 2010</td>
<td>January 30, 2015</td>
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Definitions of Decision Determinations

**Medically Necessary:** A treatment, procedure or drug is medically necessary only when it has been established as safe and effective for the particular symptoms or diagnosis, is not investigational or experimental, is not being provided primarily for the convenience of the patient or the provider, and is provided at the most appropriate level to treat the condition.

**Investigational/Experimental:** A treatment, procedure or drug is investigational when it has not been recognized as safe and effective for use in treating the particular condition in accordance with generally accepted professional medical standards. This includes services where approval by the federal or state governmental is required prior to use, but has not yet been granted.

**Split Evaluation:** Blue Shield of California / Blue Shield of California Life & Health Insurance Company (Blue Shield) policy review can result in a Split Evaluation, where a treatment, procedure or drug will be considered to be investigational for certain indications or conditions, but will be deemed safe and effective for other indications or conditions, and therefore potentially medically necessary in those instances.

Description

A prosthesis is a device designed to replace, as much as possible, the function or appearance of a missing limb or body part. The primary goals of an upper limb prosthesis are to restore appearance and function.
A myoelectric prosthesis uses electrical impulses from the residual limb's muscles that are emitted during muscle contraction to activate the prosthesis. Because the electrical impulses are not powerful enough to operate the myoelectric prosthesis, electric motors produce the movements of the prosthesis. Myoelectric upper limb prostheses are available for the hand, wrist and elbow at this time.

**Policy**

Myoelectric upper limb prosthetic components may be considered **medically necessary** when all of the following criteria are met:

- Standard body-powered prosthetic devices cannot be used or are insufficient to meet functional needs of the individual for those activities of daily living when other prosthesis are not adequate in performing activities of daily living (see Policy Guideline)
- The remaining musculature of the arm(s) contains the minimum microvolt threshold to allow operation of a myoelectric prosthetic device
- The patient has demonstrated sufficient neurological and cognitive function to operate the prosthesis effectively
- The patient is free of comorbidities that would interfere with the function of the prosthesis (neuromuscular disease, etc.)
- Functional evaluation by a qualified professional indicates that with training, use of a myoelectric prosthesis is likely to meet the functional needs of the individual (e.g., gripping, releasing, holding, and coordinating movement of the prosthesis) when performing activities of daily living. This evaluation should consider the patient's needs for control, durability (maintenance), function (speed, work capability), and usability
- A three month trial period in conjunction with an occupational therapist evaluation or hand therapist evaluation has demonstrated compliance with a myoelectric prosthesis

Replacement or repair of a myoelectric upper limb prosthesis may be considered **medically necessary** when all of the following criteria are met:

- The current prosthetic componentry is out of warranty
- The current prosthesis requires repairs and the cost of such repairs would be more than 60% of the cost of a new prosthesis

The following myoelectric upper limb components are considered **not medically necessary**:

- Custom high-definition cover or glove
- High fidelity radial interface componentry

Myoelectric upper limb prosthetic components are considered **not medically necessary** if any of the above criteria are not met, and are subject to individual review.

A prosthesis with individually powered digits, including but not limited to a partial hand prosthesis, is considered **investigational**.
Medical Policy: Myoelectric Upper Limb Prostheses
Original Policy Date: 4/2/2010
Effective Date: 1/30/2015

Policy Guideline

Blue Shield of California defines activities of daily living (ADLs) as mobility skills required for independence in normal everyday living (e.g., toileting, feeding, dressing, grooming and bathing). This does not include activities related to recreational, leisure, or sports activities.

Note: It is highly recommended that prosthetic training be provided through coordination of the prosthetist and a qualified occupational therapist or hand therapist after fitting of the myoelectric limb to ensure the patient achieves the full benefits of this prosthesis.

Comorbidities that could interfere with the function of the myoelectric upper limb prosthesis includes, but not limited to, neuromuscular disease, cardiovascular disease, and infection.

Repairs and replacements:

- Labor costs for a new prosthesis are not separately reimbursable
- Labor costs are reimbursable for repairs after the prosthesis’ warranty has expired or the prescription changes

Batteries:

- L7367 - Two lithium batteries are reimbursable, one for use and one for recharging
- L7368 - One lithium battery charger is reimbursable

SensorHand™ Speed (Otto Bock) contains the following reimbursable components:

- L7007 - Electric hand, switch or myoelectric controlled, adult
- L6881 - Automatic grasp feature, addition to upper limb prosthetic terminal device
- L6882 - Microprocessor control feature, addition to upper limb prosthetic terminal device

iLimb Hand™ (Touch Bionics) contains the following reimbursable components:

(Note: There are no specific HCPCS codes for the i-Limb Hand™ prosthesis or coverings)

- L7007 - Electric hand, switch or myoelectric controlled, adult
- L6882 - Microprocessor control feature, addition to upper limb prosthetic terminal device
- L7499 - Upper extremity prosthesis, not otherwise specified

The i-Limb Hand™ has several available options for coverings:

- i-Limb Skin: a thin layer of high-flex material, computer modeled to fit every contour of the i-Limb. Colors are black, clear, and flesh tone
- Off-the-shelf lifelike covering: high-flex material which comes in 10 skin shades
- A custom high-definition silicone glove which is considered not medically necessary and therefore not covered

Internal Information

There is an MD Determination Form for this Medical Policy. It can be found on the following Web page:
http://myworkpath.com/healthcareservices/MedicalOperations/PSR_Determination_Pages.htm
## Documentation Required for Clinical Review

- History and physical including: Date of amputation, Current physical and cognitive status
- Prescription for the prosthesis from referring physician (Physiatrist or Orthopedist)
- Name of ordering prosthetist, fax and phone number
- All prosthetists clinical/office notes including:
  - Current make, model, components in use
  - Describe daily activities and needs related to daily activities
  - Describe malfunction of current myoelectric upper limb prosthesis
  - Has a prosthesis been previously worn?
  - Is a prosthesis being currently used?
  - Rationale for a new myoelectric upper limb prosthesis
  - What is the repair cost for current prosthesis?
  - What rehabilitation has the patient received?
  - What repairs have been provided by manufacturer of myoelectric limb?
  - When was current myoelectric limb issued and when does warranty expire?
  - Why is a body-powered prosthesis not appropriate?
- Clearly list all HCPCS codes with descriptions of generic codes

The materials provided to you are guidelines used by this plan to authorize, modify, or deny care for persons with similar illness or conditions. Specific care and treatment may vary depending on individual need and the benefits covered under your contract. These Policies are subject to change as new information becomes available.
APPENDIX to Myoelectric Upper Limb Prostheses Policy

Prior Authorization Requirements

Clinical Evidence is required to determine medical necessity.

Within five days before the actual date of service, the Provider MUST confirm with Blue Shield of California / Blue Shield of California Life & Health Insurance Company (Blue Shield) that the member's health plan coverage is still in effect. Blue Shield reserves the right to revoke an authorization prior to services being rendered based on cancellation of the member's eligibility. Final determination of benefits will be made after review of the claim for limitations or exclusions.

Questions regarding the applicability of this policy should also be directed to the Prior Authorization Department. Please call 1-800-541-6652 or visit the Provider Portal www.blueshieldca.com/provider.

Evidence Basis for the Policy

Rationale

A myoelectric prosthesis uses the action potential of the residual limb muscles to control electrically powered components. An upper limb prosthesis joint movement (e.g., hand, wrist, and/or elbow) is driven by microchip-processed electrical activity in the muscles of the residual limb. The system is controlled voluntarily by the amputee.

Upper limb prostheses are classified into three categories depending on the means of generating movement at the joints: passive, body-powered, and externally powered myoelectrical movement.

The passive prosthesis is the lightest of the three types and is described as the most comfortable. Since the passive prosthesis must be repositioned manually, typically by moving it with the opposite arm, it cannot restore function.

The body-powered prosthesis utilizes a body harness and cable system to provide functional manipulation of the elbow and hand. Voluntary movement of the shoulder and/or residual limb extends the cable and transmits the force to the terminal device. Prosthetic hand attachments may be claw-like devices that allow good grip strength and visual control of objects or latex-gloved devices that provide a more natural appearance at the expense of control. Both can be opened and closed by the cable system. Patient complaints with body-powered prostheses include harness discomfort, wire failure, and the unattractive appearance.
Myoelectric prostheses utilize surface electrodes embedded in the prosthetic socket to make contact with the skin in the residual limb. Electromyographic (EMG) signals from the residual limb are detected by these electrodes, amplified, and then processed by a controller to drive battery-powered motors that move the hand, wrist or elbow. Although upper arm movement may be slow and limited to one joint at a time, myoelectric control of movement may be considered the most physiologically natural. Myoelectric hand attachments are similar in form to those offered with the body-powered prosthesis, but are battery powered. The SensorHand™ Speed, (Ottobock, Duderstadt, Germany) is described as having an AutoGrasp feature, an opening/closing speed of up to 300 mm/second, and advanced EMG signal processing. Patient dissatisfaction with myoelectric prostheses includes the increased cost, maintenance (particularly for the glove), and weight, along with limited sensory feedback and extended for training. The user must be able to isolate muscle contraction, so that if one muscle is contracted (e.g., flexion), the opposing muscle is relaxed (e.g., extension). Contraction of both muscles would result in signals turning the motor on and off at the same time, causing the device malfunction. Another recently available device, the i-Limb Hand™ (Touch Bionics, Edinburgh, Scotland), has four independent fully powered fingers and an articulating rotatable thumb. In addition, Touch Bionics, now offers ProDigits™ for partial hand amputations.

A hybrid system, a combination of body-powered and myoelectric components, may be used for high-level amputations (at or above the elbow). Hybrid systems allow control of two joints at once (i.e., one body-powered and one myoelectric) and are generally lighter and less expensive than a prosthesis composed entirely of myoelectric components.

Upper limb prostheses may include the following components:

- **Socket**
- **Suspension:**
  - Harnessed-based systems
  - Self-suspending sockets
  - Suction sockets
    - Control-cable system
    - Terminal device:
      - Passive
      - Functional
    - Cosmesis
      - Active
    - Hook
    - Prosthetic hands
- **Wrist units**
- **Elbow units**
- **Shoulder and forequarter units**
No single prosthetic device is capable of providing all of the functions of the human hand. The major function of the hand that a prosthesis tries to replicate is grip. The different types of prosthetic grips are:

- Pincher grip
- Tripod or palmar grip
- Lateral grip or key pinch
- Hook power grip
- Spherical grip
- Cylindrical Grip

Lower limb prostheses are either preparatory or definitive with HCPCS codes describing them. There are no HCPCS codes designating preparatory or definitive upper limb prostheses. A temporary prosthesis may be fit during surgery, so when the patient awakens, a limb can be visualized. This is called an immediate postoperative prosthesis (IPOP). The IPOP is usually fit in healthy young patients with traumatic amputations. The loss of an upper limb has more of a psychological impact on body image than does the loss of a lower limb. According to Malone et al., (1984) there is a “Golden Period” of fitting for upper limb prosthetic devices. This period appears to be within the three months after amputation. In addition, there appears to be no difference in ultimate prosthetic acceptance rate or use patterns as a function of the type of prosthesis initially provided. The authors suggest that all upper-limb amputees be fit as soon as possible (within 30 days to 90 days) with conventional prosthetic devices. When the patient has shown motivation and skill in the use of conventional body-powered devices, then a re-evaluation determines the appropriate externally powered prosthetic components. Finally, the authors emphasize that the best possibility for good prosthetic rehabilitation is the early application of prosthetic devices combined with intensive occupational therapy.

Technology in upper extremity prostheses is rapidly changing, driven by advances in biomedical engineering and by the U.S. Department of Defense Advanced Research Projects Agency (DARPA), which is funding a public and private collaborative effort on prosthetic research and development. Areas of development include the use of skin-like silicone elastomer gloves, “artificial muscles,” and sensory feedback. Smaller motors, microcontrollers, implantable myoelectric sensors, and re-innervation of remaining muscle fibers are being developed to allow fine movement control. Lighter batteries and newer materials are being incorporated into myoelectric prostheses to improve comfort.

Manufacturers must register prostheses with the restorative devices branch of the U.S. Food and Drug Administration (FDA) and keep a record of any complaints. These devices do not have to undergo a full FDA review.

Prospective comparative studies with objective and subjective measures would provide the most informative data on which to compare different prostheses, but little evidence was identified that directly addressed whether myoelectric prostheses improve function and health-related quality of life.

The available indirect evidence is based on 2 assumptions:

- Use of any prosthesis confers clinical benefit
• Self-selected use is an acceptable measure of the perceived benefit (combination of utility, comfort, and appearance) of a particular prosthesis for that individual

Most of the studies that were identified describe amputees' self-selected use or rejection/abandonment rates. The results are usually presented as hours worn at work, hours worn at home, and hours worn in social situations. Amputees' self-reported reasons for use and abandonment are also frequently reported. The upper limb amputee's needs may depend on their particular situation. For example, increased functional capability may be needed with heavy work or domestic duties, while a more naturally appearing prosthesis with reduced functional capability may be acceptable for an office, school, or other social environment.

Comparative Studies

One prospective controlled study compared preferences for body-powered and myoelectric hands in children (Kruger et al., 1993). Juvenile amputees (toddlers to teenagers, n = 120) were fitted in a randomized order with 1 of the 2 types of prostheses; after a 3-month period, the terminal devices were switched, and the children selected 1 of the prostheses to use. After 2 years, some (n = 11) of the original study sites agreed to reevaluate the children, and 78 (74% follow-up from the 11 sites) appeared for interview and examination. At the time of follow-up, 44% (34) were wearing the myoelectric prosthesis, 34% (26) were wearing a body-powered prosthesis (13 used hands and 13 used hooks), and 22% (18) were not using a prosthesis. There was no difference in the children's ratings of the myoelectric and body-powered devices (3.8 on a 5 point scale). Of the 60 children who wore a prosthesis, 19 were considered to be “passive” users, i.e., they did not use the prosthesis to pick up or hold objects (prehensile function).

A multicenter within-subject randomized study, published in 1993, compared function with myoelectric and body-powered hands (identical size, shape, and color) in 67 children with congenital limb deficiency and 9 children with traumatic amputation (Edelstein and Berger, 1993). Each type of hand was worn for 3 months before functional testing. Some specific tasks were performed slightly faster with the myoelectric hand; others were performed better with the body-powered hand. Overall, no clinically important differences were found in performance. Interpretation of these results is limited by changes in technology since this study was published.

Silcox and colleagues (1993) conducted a within-subject comparison of preference for body-powered or myoelectric prostheses in adults. Of 44 patients who had been fitted with a myoelectric prosthesis, 91% (44) also owned a body-powered prosthesis and 20% (9) owned a passive prosthesis. Fifty percent (22) patients had rejected the myoelectric prosthesis, 32% (18) had rejected the body-powered prosthesis, and 55% (5) had rejected the passive prosthesis. Use of a body-powered prosthesis was unaffected by the type of work; good to excellent use was reported in 35% of patients with heavy work demands and in 39% of patients with light work demands. In contrast, the proportion of patients using a myoelectric prosthesis was higher in the group with light work demands (44%) in comparison with those with heavy work demands (26%). There was also a trend toward higher use of the myoelectric prosthesis (n = 16) in comparison with a body-powered prosthesis (n = 10) in social situations. Appearance was cited more frequently (19 patients) as a reason for using a myoelectric prosthesis than any other factor. Weight (16 patients) and speed (10 patients) were more frequently cited than any other factor as reasons for non-use of the myoelectric prosthesis.
McFarland et al. (2010) conducted a cross-sectional survey of upper limb loss in veterans and service members from Vietnam (n = 47) and Iraq (n = 50) who were recruited through a national survey of veterans and service members who experienced combat-related major limb loss. In the first year of limb loss, the Vietnam group received a mean of 1.2 devices (usually body-powered), while the Iraq group received a mean of 3.0 devices (typically 1 myoelectric/hybrid, 1 body-powered, and 1 cosmetic). At the time of the survey, upper-limb prosthetic devices were used by 70% of the Vietnam group and 76% of the Iraq group. Body-powered devices were favored by the Vietnam group (78%), while a combination of myoelectric/hybrid (46%) and body-powered (38%) devices were favored by the Iraq group. Replacement of myoelectric/hybrid devices was 3 years or longer in the Vietnam group while 89% of the Iraq group replaced myoelectric/hybrid devices in under 2 years. All types of upper limb prostheses were abandoned in 30% of the Vietnam group and 22% of the Iraq group; the most common reasons for rejection included short residual limbs, pain, poor comfort (e.g., weight of the device), and lack of functionality.

James and colleagues (2006) conducted a cross-sectional study from 10 Shriners Hospitals assessed the benefit of a prosthesis (type not described) on function and health-related quality of life in 489 children 2 to 20 years of age with a congenital below-the-elbow deficiency (specific type of hand malformation). Outcomes consisted of parent- and child-reported quality of life and musculoskeletal health questionnaires and subjective and objective functional testing of children with and without a prosthesis. Age-stratified results were compared for 321 children who wore a prosthesis and 168 who did not, along with normative values for each age group. The study found no clinically relevant benefit for prosthesis wearers compared with non-wearers, or for when the wearers were using their prosthesis. Non-wearers performed better than wearers on a number of tasks. For example, in the 13- to 20-year-old group, non-wearers scored higher than wearers for zipping a jacket, putting on gloves, peeling back the plastic cover of a snack pack, raking leaves, and throwing a basketball. Although prostheses have been assumed to improve function, no benefit was identified for young or adolescent children with this type of congenital hand malformation.

Noncomparative Studies

A 2007 systematic review of 40 articles published over the previous 25 years assessed upper limb prosthesis acceptance and abandonment (Biddiss and Chau, 2007). For pediatric patients the mean rejection rate was 38% for passive prostheses (1 study), 45% for body-powered prostheses (3 studies), and 32% for myoelectric prostheses (12 studies). For adults, there was considerable variation between studies, with mean rejection rates of 39% for passive (6 studies), 26% for body-powered (8 studies), and 23% for myoelectric (10 studies) prostheses. The study authors found no evidence that the acceptability of passive prostheses had declined over the period from 1983 to 2004, “despite the advent of myoelectric devices with functional as well as cosmetic appeal”.

Body-powered prostheses were also found to have remained a popular choice, with the type of hand-attachment being the major factor in acceptance. Body-powered hooks were considered acceptable by many users, but body-powered hands were frequently rejected (80% to 87% rejection rates) due to slowness in movement, awkward use, maintenance issues, excessive weight, insufficient grip strength, and the energy needed to operate. Rejection rates of
myoelectric prostheses tended to increase with longer follow-up. There was no evidence of a change in rejection rates over the 25 years of study, but the results are limited by sampling bias from isolated populations and the generally poor quality of the studies included.

Crandall and Tomhave (2002) retrospectively analyzed 34 unilateral below-elbow pediatric amputees. All were provided with a variety of prosthetic options, including passive, conventional, and myoelectric. The average follow-up was 14 years. Final findings indicated 41% of patients (14) continue as multiple prosthetic users. Forty-one percent (14) selected the conventional prosthesis using a voluntary closing terminal device as the prosthesis of choice. Only 15% patients (5) elected the myoelectric device as their primary prosthesis. The authors concluded that successful unilateral pediatric amputees may choose multiple prostheses on the basis of function and that frequently the most functional prosthesis selected in the long term is the simplest in design.

Studies have examined the rejection/abandonment rates of children, specifically, fitted with upper limb prostheses. Meurs et al., (2006) concluded there is little evidence for a relationship between the fitting of a first prosthesis with a congenital upper limb deficiency and rejection rates or functional outcomes. James et al., (2006) assessed the quality of life and function of 489 children with a unilateral congenital below-the-elbow deficiency; 321 wore a prosthesis and 168 did not. They concluded a prosthesis may help with social acceptance or may be useful as tools for specialized activities, but does not appear to improve function or quality of life. Egermann et al., (2009) found that the level of amputation influenced user acceptance as did training by an occupational therapist. The authors found the general drop-out rate in preschool children is very low compared to adults.

Biddis and Chau (2007) investigated factors in prosthetic use and abandonment. An online or mailed survey of 242 upper limb amputees was administered. Of the survey respondents, 14% had never worn a prosthesis and 28% had rejected regular prosthetic use; 64% were either full-time or consistent part-time wearers. Factors in device use and abandonment were the level of limb absence, gender, and perceived need (e.g., working versus unemployed). Prosthesis rejectors were found to discontinue use due to a lack of functional need, discomfort (excessive weight and heat), and impediment to sensory feedback. Dissatisfaction with available prosthesis technology was a major factor in abandoning prosthesis use. No differences between users and non-users were found for experience with a particular type of prosthesis (passive, body-powered, or myoelectric) or terminal device (hand or hook).

In another online survey, the majority of the 43 responding adults used a myoelectric prosthetic arm and/or hand for 8 or more hours at work/school (approximately 86%) or for recreation (67%), while the majority of the 11 child respondents used their prosthesis for 4 hours or less at school (72%) or for recreation (88%) (Pylatiuk et al., 2007). Satisfaction was greatest (more than 50% of adults and 100% of children) for the appearance of the myoelectric prosthesis and least (more than 75% of adults and 50% of children) for the grasping speed, which was considered too slow. Of 33 respondents with a transradial amputation, 55% considered the weight “a little too heavy” and 24% considered the weight to be “much too high.” The types of activities that the majority of adults (between 50% and 80%) desired to perform with the myoelectric prosthesis were handicrafts, operation of electronic and domestic devices, using cutlery, personal hygiene, dressing and undressing, and to a lesser extent, writing. The majority (80%) of children indicated...
that they wanted to use their prosthesis for dressing and undressing, personal hygiene, using cutlery, and handicrafts.

A 2009 study evaluated the acceptance of a myoelectric prosthesis in 41 children 2 to 5 years of age (Egerman et al., 2009). To be fitted with a myoelectric prosthesis, the children had to communicate well and follow instructions from strangers, have interest in an artificial limb, have bimanual handling (use of both limbs in handling objects), and have a supportive family setting. A 1 to 2 week interdisciplinary training program (in-patient or out-patient) was provided for the child and parents. At a mean 2 years' follow-up (range 0.7 to 5.1 years), a questionnaire was distributed to evaluate acceptance and use during daily life (100% return rate). Successful use, defined as a mean daily wearing time of more than 2 hours, was achieved in 76% of the study group. The average daily use was 5.8 hours per day (range 0 to 14 hours). The level of amputation significantly influenced the daily wearing time, with above elbow amputees wearing the prosthesis for longer periods than children with below elbow amputations. Three of 5 children (60%) with amputations at or below the wrist refused use of any prosthetic device. There were trends (i.e., did not achieve statistical significance in this sample) for increased use in younger children, in those who had in-patient occupational training, and in those children who had a previous passive (versus body-powered) prosthesis. During the follow-up period, maintenance averaged 1.9 times per year (range of 0 to 8 repairs); this was correlated with the daily wearing time. The authors discussed that a more important selection criteria than age was the activity and temperament of the child; for example, a myoelectric prosthesis would more likely be used in a calm child interested in quiet bimanual play, whereas a body-powered prosthesis would be more durable for outdoor sports, and in sand or water. Due to the poor durability of the myoelectric hand, this group provides a variety of prosthetic options to use depending on the situation. The impact of multiple prostheses types (e.g., providing both a myoelectric and body-powered prosthesis) on supply costs, including maintenance frequency, are unknown at this time.

An evaluation of a rating scale called the Assessment of Capacity for Myoelectric Control (ACMC) was described by Lindner and colleagues in 2009. For this evaluation of the ACMC, a rater identified 30 types of hand movements in a total of 96 patients (age range 2 to 57 years) who performed a self-chosen bimanual task, such as preparation of a meal, making the bed, doing crafts, or playing with different toys; each of the 30 types of movements was rated on a 4-point scale (not capable or not performed, sometimes capable, capable on request, and spontaneously capable). The types of hand movements were variations of four main functional categories (gripping, releasing, holding, and coordinating), and the evaluations took approximately 30 minutes. Statistical analysis indicated that the ACMC is a valid assessment for measuring differing ability among users of upper limb prostheses, although the assessment was limited by having the task difficulty determined by the patient (e.g., a person with low ability might have chosen a very easy and familiar task). Lindner et al. (2009) recommended that further research with standard tasks is needed and that additional tests of reliability are required to examine the consistency of the ACMC over time.

Although the availability of a myoelectric hand with individual control of digits has been widely reported in lay technology reports, video clips and basic science reports, no peer-reviewed publications were found to evaluate functional outcomes of individual digit control in amputees.
Summary

The goals of upper limb prostheses relate to restoration of both appearance and function while maintaining sufficient comfort for continued use. The identified literature focuses primarily on patient acceptance and reasons for disuse. Detailed data on function and functional status, and direct comparisons of body-powered and newer model myoelectric prostheses are lacking. The limited evidence available suggests that in comparison with body-powered prostheses, myoelectric components may improve range of motion to some extent, have similar capability for light work, but may have reduced performance under heavy working conditions. The literature also indicates that the percentage of amputees who accept use of a myoelectric prosthesis is about the same as those who prefer to use a body-powered prosthesis, and that self-selected use depends at least in part on the individual's activities of daily living. Appearance is most frequently cited as an advantage of myoelectric prostheses; and for patients who desire a restorative appearance, the myoelectric prosthesis can provide greater function than a passive prosthesis, with equivalent function to a body-powered prosthesis for light work. Non-use of any prosthesis is associated with lack of functional need, discomfort (excessive weight and heat), and impediment to sensory feedback. Because of the differing advantages and disadvantages of the currently available standard prostheses, myoelectric components may be considered when passive or body-powered prostheses cannot be used or are insufficient to meet the functional needs of the patient in activities of daily living. Evidence is insufficient to evaluate full or partial hand prostheses with individually powered digits; these are considered investigational.

Benefit Application

Benefit determinations should be based in all cases on the applicable contract language. To the extent there are any conflicts between these guidelines and the contract language, the contract language will control. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

Some state or federal mandates (e.g., Federal Employee Program (FEP)) prohibit Plans from denying Food and Drug Administration (FDA) - approved technologies as investigational. In these instances, plans may have to consider the coverage eligibility of FDA-approved technologies on the basis of medical necessity alone.

This Policy relates only to the services or supplies described herein. Benefits may vary according to benefit design; therefore, contract language should be reviewed before applying the terms of the Policy. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement.

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<th>Type</th>
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<tr>
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<tr>
<td>Type</td>
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<tr>
<td>HCPC</td>
<td>L6026</td>
<td>Transcarpal/metacarpal or partial hand disarticulation prosthesis, external power, self-suspended, inner socket with removable forearm section, electrodes and cables, two batteries, charger, myoelectric control of terminal device, excludes terminal device(s)</td>
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<tr>
<td></td>
<td>L6621</td>
<td>Upper extremity prosthesis addition, flexion/extension wrist with or without friction, for use with external powered terminal device</td>
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<tr>
<td></td>
<td>L6628</td>
<td>Upper extremity addition, quick disconnect hook adapter, ottobock or equal</td>
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<td></td>
<td>L6629</td>
<td>Upper extremity addition, quick disconnect lamination collar with coupling piece, ottobock or equal</td>
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<td></td>
<td>L6638</td>
<td>Upper extremity addition to prosthesis, electric locking feature, only for use with manually powered elbow</td>
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<tr>
<td></td>
<td>L6693</td>
<td>Upper extremity addition, locking elbow, forearm counterbalance</td>
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<td></td>
<td>L6715</td>
<td>Terminal device, multiple articulating digit, includes motor(s), initial issue or replacement</td>
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<tr>
<td></td>
<td>L6810</td>
<td>Addition to terminal device, precision pinch device</td>
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<tr>
<td></td>
<td>L6880</td>
<td>Electric hand, switch or myolelectric controlled, independently articulating digits, any grasp pattern or combination of grasp patterns, includes motor(s)</td>
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<tr>
<td></td>
<td>L6881</td>
<td>Automatic grasp feature, addition to upper limb electric prosthetic terminal device</td>
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<tr>
<td></td>
<td>L6882</td>
<td>Microprocessor control feature, addition to upper limb prosthetic terminal device</td>
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<td></td>
<td>L6890</td>
<td>Addition to upper extremity prosthesis, glove for terminal device, any material, prefabricated, includes fitting and adjustment</td>
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<td>L6925</td>
<td>Wrist disarticulation, external power, self-suspended inner socket, removable forearm shell, ottobock or equal electrodes, cables, two batteries and one charger, myoelectronic control of terminal device</td>
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<td>L6935</td>
<td>Below elbow, external power, self-suspended inner socket, removable forearm shell, ottobock or equal electrodes, cables, two batteries and one charger, myoelectronic control of terminal device</td>
</tr>
<tr>
<td></td>
<td>L6945</td>
<td>Elbow disarticulation, external power, molded inner socket, removable humeral shell, outside locking hinges, forearm, ottobock or equal electrodes, cables, two batteries and one charger, myoelectronic control of terminal device</td>
</tr>
<tr>
<td></td>
<td>L6955</td>
<td>Above elbow, external power, molded inner socket, removable humeral shell, internal locking elbow, forearm, ottobock or equal electrodes, cables, two batteries and one charger, myoelectronic control of terminal device</td>
</tr>
<tr>
<td></td>
<td>L6965</td>
<td>Shoulder disarticulation, external power, molded inner socket, removable shoulder shell, shoulder bulkhead, humeral section, mechanical elbow, forearm, ottobock or equal electrodes, cables, two batteries and one charger, myoelectronic control of terminal device</td>
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<tr>
<td></td>
<td>L6975</td>
<td>Interscapular-thoracic, external power, molded inner socket, removable shoulder shell, shoulder bulkhead, humeral section, mechanical elbow, forearm, ottobock or equal electrodes, cables, two batteries and one charger, myoelectronic control of terminal device</td>
</tr>
<tr>
<td></td>
<td>L7007</td>
<td>Electric hand, switch or myoelectric controlled, adult</td>
</tr>
<tr>
<td></td>
<td>L7008</td>
<td>Electric hand, switch or myoelectric, controlled, pediatric</td>
</tr>
<tr>
<td></td>
<td>L7009</td>
<td>Electric hook, switch or myoelectric controlled, adult</td>
</tr>
<tr>
<td></td>
<td>L7045</td>
<td>Electric hook, switch or myoelectric controlled, pediatric</td>
</tr>
<tr>
<td></td>
<td>L7180</td>
<td>Electronic elbow, microprocessor sequential control of elbow and terminal device</td>
</tr>
<tr>
<td></td>
<td>L7181</td>
<td>Electronic elbow, microprocessor simultaneous control of elbow and terminal device</td>
</tr>
<tr>
<td></td>
<td>L7190</td>
<td>Electronic elbow, adolescent, variety village or equal, myoelectronically controlled</td>
</tr>
<tr>
<td></td>
<td>L7191</td>
<td>Electronic elbow, child, variety village or equal, myoelectronically controlled</td>
</tr>
<tr>
<td></td>
<td>L7259</td>
<td>Electronic wrist rotator, any type</td>
</tr>
</tbody>
</table>
### Tables

N/A

### Definitions

**Cosmesis** - The way a natural hand or arm looks physically and aesthetically.

**Multi-Function Prosthetic Testing Module** - A modular device with interchangeable mechanical and electronic prosthetic components that allows an occupational therapist to test a patient's potential upper limb prosthetic function.

**Prosthetist** - A health care specialist trained to design, fabricate and fit artificial limbs.

**Socket** - An inner socket is fabricated to fit the patient's residual limb and the second, outer wall is added, designed to be the same length and contours as the opposite sound limb.

**Suspension sleeve** - A device which holds the prosthesis securely to the residual limb and accommodates and distributes the forces associated with the weight of the prosthesis and any superimposed lifting loads.

### Index / Cross Reference of Related BSC Medical Policies

The following Medical Policies share diagnoses and/or are equivalent BSC Medical Policies:

- Microprocessor-Controlled Lower Limb Prostheses
Key / Related Searchable Words

- Body-powered prosthesis
- Myoelectric prosthesis
- Prosthesis
- Upper limb prosthesis

References


**Policy History**

This section provides a chronological history of the activities, updates and changes that have occurred with this Medical Policy.

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Action</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/2/2010</td>
<td>BCBSA Medical Policy adoption</td>
<td>Medical Policy Committee</td>
</tr>
<tr>
<td>3/13/2012</td>
<td>Coding Update</td>
<td>Administrative Review</td>
</tr>
<tr>
<td>3/13/2013</td>
<td>Policy revision without position change</td>
<td>Medical Policy Committee</td>
</tr>
<tr>
<td>3/29/2013</td>
<td>Policy revision with position change</td>
<td>Medical Policy Committee</td>
</tr>
<tr>
<td>1/30/2015</td>
<td>Coding update</td>
<td>Administrative Review</td>
</tr>
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</table>

The materials provided to you are guidelines used by this plan to authorize, modify, or deny care for persons with similar illness or conditions. Specific care and treatment may vary depending on individual need and the benefits covered under your contract. These Policies are subject to change as new information becomes available.