# Upper Extremity Microprocessor Devices

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## Health Equity Considerations

Health equity is the highest level of health for all individuals; health inequity is the avoidable difference in health status or distribution of health resources due to the social conditions in which individuals are born, grow, live, work, and age.

Social determinants of health are the conditions in the environment that affect a wide range of health, functioning, and quality of life outcomes and risks. Examples include the following: safe housing, transportation, and neighborhoods; racism, discrimination, and violence; education, job opportunities, and income; access to nutritious foods and physical activity opportunities; access to clean air and water; and language and literacy skills.

## Upper Extremity (UE) Microprocessor Devices

A myoelectric upper extremity prosthetic device is considered medically necessary for individuals with traumatic or congenital absence of the upper limb when there is documentation of **all** the following criteria:

- The residual limb is able to tolerate the weight of the myoelectric prosthetic device.
- The residual limb musculature has the minimum microvolt threshold to allow operation of the myoelectric prosthetic device.
- There are no medical condition(s) that may interfere with use of the myoelectric prosthetic device (e.g., neuromuscular disease).
- A standard body-powered prosthetic device is unable to be used **or** is unable to meet the functional needs of the individual.
- The individual has the cognitive function to utilize a myoelectric prosthetic device.
- The individual had training with the myoelectric prosthetic device.

## Evidence Discussion

Upper extremity microprocessor-controlled prosthetic devices represent a significant advancement in the field of rehabilitation and assistive technology. These devices integrate sensors, motors, and microprocessors to interpret user intent and execute





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complex movements, often mimicking the natural function of the human arm and hand.[1] Myoelectric prostheses, a subset of these technologies, have proven to be effective and efficient.[2]

Myoelectric prostheses rely on electromyographic (EMG) signals generated by residual limb musculature to control prosthetic movement.[3] These signals are detected by surface electrodes and processed by the device's microcontroller to perform tasks such as gripping, releasing, and wrist rotation. The integration of microprocessors allows for more refined control strategies, including proportional and pattern recognition-based systems, which enhance responsiveness and adaptability to user needs.[4]

Myoelectric upper limb prosthetics are designed to restore functional capabilities and improve quality of life for individuals with upper extremity amputations. Evidence suggests potential benefits over body-powered prostheses, including active opening and closing mechanisms, improved cosmesis, and potential relief from phantom limb pain.[5][6]

There is a dearth of evidence regarding different prosthesis types, which include factors such as limitations in study design and small sample sizes that can make it challenging to find statistically significant results.[2]

## Codes

| HCPCS Code | Description |
|---|---|
| L6882 | Microprocessor control feature, addition to upper limb prosthetic terminal device |
| L8701 | Powered upper extremity range of motion assist device, elbow, wrist, hand with single or double upright(s), includes microprocessor, sensors, all components and accessories, custom fabricated |
| L8702 | Powered upper extremity range of motion assist device, elbow, wrist, hand, finger, single or double upright(s), includes microprocessor, sensors, all components and accessories, custom fabricated |

1 Bates TJ, Fergason JR, Pierrie SN. Technological Advances in Prosthesis Design and Rehabilitation Following Upper Extremity Limb Loss.*Curr Rev Musculoskelet Med*. 2020;13(4):485-493. doi:10.1007/s12178-020-09656-6

2 Uellendahl JE. Upper extremity myoelectric prosthetics.*Phys Med Rehabil Clin N Am*. 2000;11(3):639-652.

3 Engdahl, S.M., Gonzalez, M.A., Lee, C.et al.Perspectives on the comparative benefits of body-powered and myoelectric upper limb prostheses.*J NeuroEngineering Rehabil*.21, 138 (2024). https://doi.org/10.1186/s12984-024-01436-4>

4 Geethanjali P. Myoelectric control of prosthetic hands: state-of-the-art review.*Med Devices (Auckl)*. 2016;9:247-255. Published 2016 Jul 27. doi:10.2147/MDER.S91102

5 Savitz BL, Dean YE, Popa NK, et al. Targeted Muscle Reinnervation and Regenerative Peripheral Nerve Interface for Myoelectric Prosthesis Control: The State of Evidence.*Ann Plast Surg*. 2025;94(6S Suppl 4):S572-S576. doi:10.1097/SAP.0000000000004273

6 Dan A. Zlotolow, Scott H. Kozin. Advances in Upper Extremity Prosthetics. *Hand Clinics*. 2012;28,(4): 587-593. https://doi.org/10.1016/j.hcl.2012.08.014

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