

LUKE Arm

Clinician Information and Screening Considerations

Background

The development of the LUKE Arm (formerly DEKA Arm) was funded by the Defense Advanced Research Projects Agency's (DARPA) Revolutionizing Prosthetics program beginning in 2006. Through a series of research studies and technology advances, the Generation 3 DEKA arm was developed and tested. This led to FDA approval of the DEKA Arm System on May 9, 2014 and paved the way for the device to be manufactured and marketed, and made available to Military Health System (MHS) beneficiaries with upper extremity amputations. The LUKE Arm is now commercially available through Mobius Bionics LLC (Manchester, NH).

LUKE Arm Description and General Considerations

The LUKE Arm is a modular prosthetic arm that is configurable for different levels of amputation including transradial, transhumeral, and shoulder disarticulation. In its maximum configuration, it has 10 powered degrees of freedom that are capable of movement at the same time. The hand has many preprogrammed grips using four individually controlled degrees of freedom. The hand also includes a sensor that provides grip force feedback. The LUKE Arm can be controlled by a variety of input devices such as surface EMG electrodes and pressure switches. In addition, the LUKE Arm may be controlled by intuitive wireless IMUs (inertial measurement units) that are typically worn on top of the shoes. The clinical team and the client work together to develop the input configuration that best meets the client's needs. The LUKE Arm provides resistance against light rain and fine dust, allowing wearers peace of mind when using the arm outside the home.

Candidacy Determination Considerations

Fitting and training with the LUKE Arm requires a significant commitment on the part of the MHS beneficiary. This commitment involves travel to a MHS Advanced Rehabilitation Center and multiple sessions of therapy for training on how to use the device. This training will take place both at the Advanced Rehabilitation Center as well as in the MHS beneficiary's local community. The following considerations should be used to assist in determining a beneficiary's candidacy for further evaluation at an Advanced Rehabilitation Center.

Considerations for Inclusion

1. At least 18 years old.
2. Have a single or bilateral upper limb amputation.
3. Ability to understand the fitting and training requirements of the LUKE Arm.
4. Have active control over one or both ankles, OR have an appropriate number of myoelectric and/or other control sites.

Considerations for Exclusion

1. Amputation level of elbow disarticulation, wrist disarticulation or partial hand.
2. Residual limb condition that would prohibit socket fitting.
3. Significant uncorrectable visual deficits that impairs the ability to see the prosthesis.

4. Major communication deficits.
7. Neuropathy, uncontrolled diabetes, insensate feet, a history of skin ulcers, is receiving dialysis or has any other significant comorbidity which would interfere with fitting and training requirements.
8. Severe circulatory problems including peripheral vascular disease and pitting edema.
9. Cognitive deficits or mental health problems that would limit their ability to participate fully in the fitting and training requirements.

Evaluation and Fitting Process

Evaluation and Fitting Requirements: The evaluation for fitting with the LUKE Arm will include an initial screening by the MHS beneficiary's local amputation care team. If the beneficiary is deemed to meet the majority of the inclusion and exclusion considerations noted above, the patient should be referred to point-of-contact noted below. Once contacted, the beneficiary will undergo additional screening procedures by the DoD Advanced Rehabilitation Center. This evaluation may include a chart review, telephone interview, and either an in-person or telehealth evaluation.

Travel and Housing Requirements: The fitting and training process will require the MHS beneficiary to travel and to lodge for approximately 2 weeks at a DoD Advanced Rehabilitation Center. Travel and lodging arrangements will be in accordance with current policy, procedure and regulation. Fitting and Training with the LUKE Arm may also require travel to Mobius Bionics in Manchester, NH, by the beneficiary and the MHS clinical team.

Referral Information

To request additional information or to refer a MHS beneficiary for consideration for fitting with the LUKE Arm, contact Chief, Clinical Programs, Extremity Trauma and Amputation Center of Excellence, at 703-681-4262 or usarmy.ncr.hqda-otsg.list.eace-clinical-affairs@mail.mil.