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Prosthetics • Orthotics

Myoelectric Upper Extremity Prosthesis

Key Benefits

- Closely mimics the natural function of a biological arm, enabling wearers to pinch, grip and release objects.
- Offers a dramatically expanded range of motion over other upper extremity designs, performing comfortably above the head, down by the feet, and extended to the sides of the body.
- Enables wearer to participate in a broad range of normal daily activities.
- Operates easily, through muscle flexion, eliminating cables, straps and harnesses normally required to operate other arm/hand prostheses.
- Cosmetic skin made of silicon or latex can be applied to the prosthesis, creating a more realistic appearance
- Can be donned and doffed easily and independently
- May prevent or reduce phantom pain

General Description

Myoelectrically controlled arm prostheses are externally powered prostheses, which means that they are not driven by the muscle strength of the patient, but with the aid of electric power.

Whenever a muscle in the residual arm or shoulder is consciously contracted, it generates a small electrical signal that is detected by an electrode attached to the surface of the skin. The amplified signal is processed by a controller that activates small electric motors in the hand (or hook), the wrist, or the elbow, which in turn move that portion of the prosthetic arm, and direct its movement and function to an amazing degree of precision. Wrist rotation, elbow flexion, and grip forces of up to 30 pounds are now possible — separately or in combination.

Not everyone is a candidate for a myoelectric upper extremity prosthesis: the key muscle(s) in an amputee's body must be capable of generating an electrical signal strong enough to be detected on the skin's surface, and amplified to allow the arm to produce movement.

Image courtesy of Otto Bock HealthCare

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