Types of Upper Limb Prostheses

There are a variety of upper limb prostheses, with many serving different purposes. Some are more cosmetic, while others are more functional. Some are designed for everyday tasks, and others are designed for specific activities.

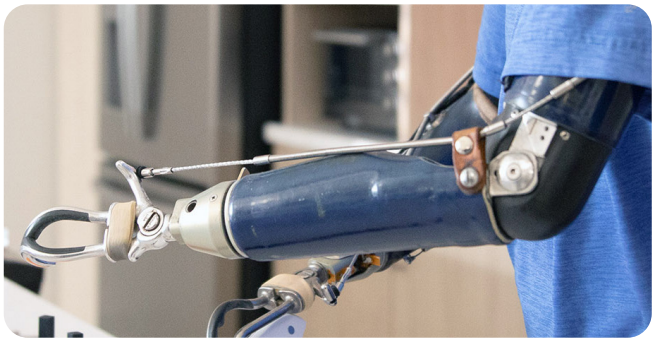
OPPOSITIONAL/PASSIVE

Passive prostheses are often silicone and designed to look like natural arms, hands, and fingers. While these prostheses are often chosen for cosmetic purposes, they are also lightweight and may improve your function by providing a surface for stabilizing or carrying objects.

Another option are passive positional digits. These often have a high-tech, metallic appearance and can handle more rugged use and weight bearing. The fingers can be positioned by pushing the fingertips against a firm surface to the degree of flexion needed for a specific object or task.

BODY-POWERED

Body-powered prostheses are typically a prosthetic hook or hand that is operated by your body movements through a combination of the body harness, upper-body muscles, and your sound limb, all connected with a cable.



Body-powered prostheses are useful tools that can restore the ability to pick up and grasp objects and assist your sound hand. They offer the most rugged, heavy-duty option, can be made of 3D printed plastic, aluminum, steel, or titanium, and can be rubber lined for better gripping.

Hooks are one of the most common terminal devices (the part of your arm that interacts with the people and things around you) for body-powered prostheses. They can handle a wide range of tasks, from gripping a steering wheel to carrying a heavy load. Other options include voluntary closing terminal devices, which remain open until you pull the operating cable, and body-powered prostheses that look like conventional hands.

EXTERNALLY-POWERED

Myoelectric devices are those that use electrodes on the residual limb to pick up electrical impulses the body creates when muscles are contracted to perform a specific action. Upper limb myoelectric devices are

available for all levels of upper limb loss and include myoelectric fingers, hands, hooks, and elbows and wrists.

Myoelectric devices require training to get familiar with contracting different muscles in order to generate the desired response. Often there are three phases of training with an upper limb prosthesis.

- **Signal Training:** Learning to control the muscle(s) required to operate the myoelectric arm by producing signals at will when movement is required and inhibiting signals when movement is not required.
- **Control Training:** Learning to control the muscle(s) appropriately to perform a required function such as grasping and releasing.
- **Functional Training:** Learning to perform daily tasks you will want to at home and in life.

Patience will pay off as myoelectric devices can create a very functional, life-like experience once you learn to use them.

HYBRID

Hybrid prostheses combine two different types of the above-mentioned devices into one prosthesis. For people with higher levels of limb loss who require more than one movable component, hybrid devices can be very helpful. A hybrid may have an increased area of function that can broaden its use on the job and in other activities. For example, a hybrid prosthesis could be a body-powered elbow and myoelectric hand or hook.

ACTIVITY-SPECIFIC

Activity-specific prostheses are designed for an activity where a passive, body-powered, or myoelectric prosthesis could be damaged or simply won't work as needed for specific activities such as work, sports, hobbies and other specialized activities.