



*From left to right:*

Members of the Center for Upper Extremity Restoration (from left to right): Richard Redett, M.D.; Marlis Gonzalez Fernandez, M.D.; Gerald Brandacher, M.D.; W.P. Andrew Lee, M.D.; Damon Cooney, M.D.; Jaimie Shores, M.D.; Albert Chi, M.D.

### Explore your options

Call 443-997-1583 to schedule a consultation with our upper-extremity restoration experts.

[hopkinsmedicine.org/handtransplant](http://hopkinsmedicine.org/handtransplant)

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#### The Johns Hopkins Hospital Outpatient Center

601 North Caroline Street  
Baltimore, MD

#### Johns Hopkins Bayview Medical Center

4940 Eastern Avenue  
Baltimore, MD



The Center for  
Upper Extremity  
Restoration (CUER)  
at Johns Hopkins



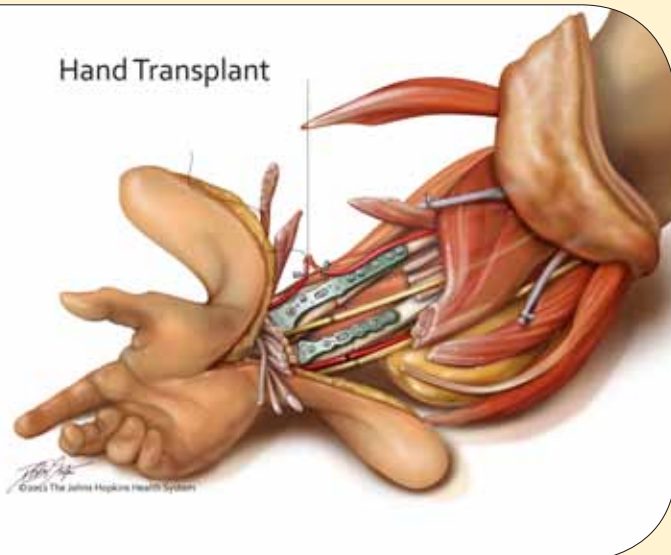
# Comprehensive care for those with upper-extremity injuries

At Johns Hopkins, we treat injuries or defects of the arm and/or hand with the newest and most innovative technologies and procedures available. Because our team of plastic and reconstructive surgeons, trauma and critical care surgeons, orthopedic surgeons, physical medicine and rehabilitation specialists, engineers and dedicated researchers understand the importance of restoring a person's ability to perform functional tasks and interact with the surrounding physical world, we tailor our treatments to each individual's needs.

## Our treatment options include:

- Hand/arm transplantation—an IRB-approved research study
- Targeted muscle reinnervation (TMR)
- Advanced neurally integrated prosthetic arms—under development at the Johns Hopkins Applied Physics Laboratory

Although not every person is a candidate for these treatments, we help guide patients and their family through the evaluation process to determine the best course of treatment.



## Hand/Arm Transplantation

(JHM IRB #NA\_00046418)

Transplantation of a hand or arm is an operation tailored to each patient's individual needs, type of injury and anatomy. The operation transplants an upper extremity, usually at the level of the forearm or wrist, but sometimes above the elbow, to help restore function after the loss of an arm or hand. Our expert rehabilitation team helps the transplant recipient learn to use the transplanted hand and arm.

Reconstructive surgeons at Johns Hopkins have worked to develop a unique immunosuppression protocol that decreases the number of medications needed to prevent rejection of the transplant. This protocol can help significantly decrease the side effects of the anti-rejection regimen and has been successfully applied in several hand transplant recipients.

## Who is eligible for a hand/arm transplant?

Not every person who is missing a hand or upper limb is eligible to receive a transplant. Some people find a prosthetic difficult to use, and the lack of sensory "feedback" from the prosthesis can significantly limit their function. These are people who may wish to consider hand or arm transplantation. We provide information regardless of the nature of the injury or defect.

## Targeted Muscle Reinnervation

Targeted muscle reinnervation (TMR) is a surgical procedure that reassigns nerves that once controlled the arm and/or hand. By reassigning these nerves, doctors can make it possible for people who have had upper-extremity amputations to better use and control their myoprosthetic limb device. People who undergo TMR surgery will be fitted with and taught how to use a newer-generation myoelectric prosthetic arm. With expert rehabilitation therapy, the person with a myoelectric prosthesis can experience significantly greater functionality than with a traditional prosthesis.

## Who is eligible for targeted muscle reinnervation?

In general, those who are eligible have an amputation at or below the shoulder within the last 10 years with stable healed tissues and a willingness to participate in ongoing rehabilitation. Those who were born without all or part of their arm and those who have nerve damage, degeneration and paralysis are not candidates for TMR.