



BACKGROUND: A prosthetic is an artificial substitute or replacement of a part of the body. It's a custom fit artificial limb, known as "protheses." A prosthesis can improve the function and lifestyle of a person who has lost a limb. The prosthesis must be a unique combination of appropriate materials, alignment, design, and construction. Prosthetics used for lower limb loss can help with stability in standing and walking, shock absorption, energy storage and return, cosmetic appearance, and even running, jumping, and other athletic activities. Prosthetics used for upper limb loss can help with reaching and grasping, occupational challenges including hammering, painting, or weight lifting, and activities of daily living like eating, writing, and dressing. A person may have been born with limb deficiency or have experienced amputation due to trauma, cancer, infection, or abnormalities in blood vessels or nerves.

(Source: http://www.opcareers.org/what_is_op/prosthetics/)

VARIOUS TYPES OF PROSTHESES: There are two types of transradial prostheses, or an artificial limb that replaces an arm missing below the elbow. The cable operated limb works by attaching a harness and cable around the opposite shoulder of the damaged arm. The myoelectric arm works by sensing when the muscles in the upper arm moves, causing an artificial hand to open or close. A transfemoral prosthesis is an artificial limb that replaces a leg missing above the knee. A patient must use approximately 80% more energy to walk than a person with two legs. The newer designs include hydraulics, carbon fiber, mechanical linkages, motors, computer microprocessors, which give more control to the user. A transtibial prosthesis is an artificial limb that replaces a leg missing below the knee. Patients usually regain normal movement faster than someone with a transfemoral amputation, due in large part to retaining the knee, which allows for easier movement. A transhumeral prosthesis is an artificial limb that replaces an arm missing above the elbow. These patients experience some of the same problems as transfemoral amputees, due to the similar complexities associated with the movement of the elbow. This makes mimicking the correct motion with an artificial limb very difficult.

(Source: <https://www.disabled-world.com/assistivedevices/prostheses/>)

TAILORING TREATMENT: The greatest limiting factor of transplantation is the patient's tolerance to the immunosuppression treatment that is required. Specialists at Johns Hopkins are designing, and continually refining, a groundbreaking protocol of minimal immunosuppression. "Because side effects and drug toxicities are minimized, this protocol could open up the field of extremity transplantation to become more mainstream," said Gerald Brandacher, MD, Professor of Plastic and Reconstructive Surgery. The milder protocol involves an antibody to deplete immune cells at the time of transplantation, followed by a single immunosuppressive agent at low levels immediately after surgery. Then, bone marrow cells from the donor are infused two weeks later to modulate, rather than suppress, the recipient's immune system. W.P. Andrew Lee, MD, Hand and Reconstructive Surgeon, said, "There are other centers in the world that perform hand and face transplants, but our program is unique in using an immuno-modulatory protocol that minimizes the side effects of medications for the transplant recipients. We believe it is a critical aspect to make these types of transplants widespread,".

(Source: <https://clinicalconnection.hopkinsmedicine.org/news/tailoring-treatment-for-transplant-and-prosthetics-patients>)

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GO TO: ICORESinfo@ucsf.edu

Scott Maier, Sr. Public Information Representative
Scott.maier@ucsf.edu / (415) 476-3595

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