



Amputation Rehabilitation

Patient Guide

Overview

According to the Centers for Disease Control and Prevention, there are nearly 2 million people who have experienced limb loss in the United States today.¹

Each year, an estimated 185,000 Americans lose a limb. More than half of these are due to a vascular disorder (54 percent, according to the Amputee Coalition of America). In the other half of cases (45 percent), limb loss is caused by injury to the affected limb. Amputations to remove cancerous tumors account for about 2 percent of cases.²

In this treatment guide, you'll find information about limb loss and its causes. You'll also find information about recovery, rehabilitation, prosthetic options and life after limb loss. We hope it answers some of your questions about living with limb loss.

Although we hope this guide will be a helpful resource for you, it is important to talk with your doctor about your specific condition. You have the right to understand your condition and the treatment options that are available, and to have your questions answered by your doctor. At the University of Maryland Rehabilitation & Orthopaedic Institute, we're happy to consult with patients recovering from, or preparing for, loss of a limb.

Building on our proud 120-year history, the University of Maryland Rehabilitation & Orthopaedic Institute is the largest acute rehabilitation provider in Maryland. As a specialty hospital, our sole focus is rehabilitation and orthopaedic injury, including amputation.

We are part of the renowned University of Maryland Medical System, with expert physicians, nurses, therapists and dedicated specialists whose goal is to help you get back to the highest possible level of function and independence.

¹ Centers for Disease Control and Prevention. "Limb Loss Awareness." www.cdc.gov/ncbddd/disabilityandhealth/features/limb-loss-awareness.html Updated April 20, 2015.
² Amputee Coalition of America. "Limb Loss Statistics." www.amputee-coalition.org/resources/limb-loss-statistics 2016.

TABLE OF CONTENTS

Limb Loss Basics
PAGE 2

Acute Hospitalization
PAGE 2

Inpatient Rehabilitation
PAGE 2

Outpatient Rehabilitation
PAGE 3

Prosthetics
PAGE 3

Life After Amputation
PAGE 5

About the University of
Maryland Rehabilitation &
Orthopaedic Institute
PAGE 6

Call us for a consultation
888-453-7626

For more information
visit us online at
UMRehabOrtho.org



"We develop a customized plan for each person, and we develop lifelong relationships with the individuals we serve. They've survived the worst, but we hope that by working with us they will not just survive, but thrive."

Dr. Melita Theyagaraj, Director of the University of Maryland Rehabilitation & Orthopaedic Institute's Amputee Clinic

Limb Loss Basics

WHAT IS AMPUTATION?

Amputation is a surgical procedure to remove a limb (an arm or a leg) or a portion of a limb (a finger, hand, toe or foot). Amputations may become necessary for several reasons. The two major categories of amputation are traumatic amputation and non-traumatic amputation.

WHAT IS TRAUMATIC AMPUTATION?

Traumatic amputation occurs after an injury (trauma) that has damaged the limb. Examples of traumatic injuries that may require amputation include injuries sustained during automobile accidents and explosions.

WHAT IS NON-TRAUMATIC AMPUTATION?

Non-traumatic amputation occurs when the limb has been damaged over time by illness. Some diseases affect how easily blood travels throughout the body. If a limb does not get enough blood, it will begin to die. People with diabetes, high blood pressure or other disorders that affect blood flow to the limbs (vascular disorders) are at higher risk of non-traumatic amputation.

STAYING HEALTHY

Both Before and After Limb Loss

More than half of those who will experience limb loss this year are also battling long-term conditions like diabetes or vascular disease. To prevent limb damage, keep these tips in mind:

1. **Know your numbers:** Get your blood sugar (glucose), cholesterol and blood pressure checked regularly.
2. **Take your medication as prescribed:** If you take medicine for a chronic condition, follow your doctor's instructions by taking the right amount at the right time, every time.
3. **Follow your doctor's diet and exercise guidelines:** What you eat and how you exercise has a big impact on your overall health.
4. **Take care of your feet:** Because nerve damage in the feet puts you at greater risk for lower limb loss, inspect your feet daily, protect them from hot and cold, wear shoes and socks every day, keep the skin moisturized and toenails trimmed, and have them inspected regularly by a doctor.

Acute Hospitalization

After the surgical procedure, you will spend some time in the hospital. Your wound will be monitored carefully as it begins to heal. In this first phase, the hospital's focus is typically on surgical recovery and pain management.

When you are discharged from the hospital, you may go to an acute (inpatient) rehabilitation hospital like the University of Maryland Rehabilitation & Orthopaedic Institute. Because inpatient rehabilitation offers more intensive rehabilitation and staff who specialize in working with people recovering from injury or surgery, patients can typically expect much better outcomes from inpatient rehabilitation than from a skilled nursing facility.



Inpatient Rehabilitation

In addition to rest and healing, most patients can expect to begin extensive regimens of physical and occupational therapy during inpatient rehabilitation. You should anticipate your healthcare team to conduct a careful evaluation of your condition and design a rehabilitation plan that keeps your goals in mind.

Inpatient rehabilitation's focus is on functional recovery, including both mobility and self-care skills. Your therapy team will work with you to restore your functional mobility and ability to conduct activities of daily living like getting dressed and preparing meals. You'll also learn how to care for the surgical site wound, manage swelling, get psychosocial support and receive ongoing diet and nutrition education if your condition warrants it. You can also expect to get the prosthetic selection process started by determining your needs and goals for a prosthetic device.

As you get stronger, your rehabilitation will likely get harder. This helps you to continue to make progress.

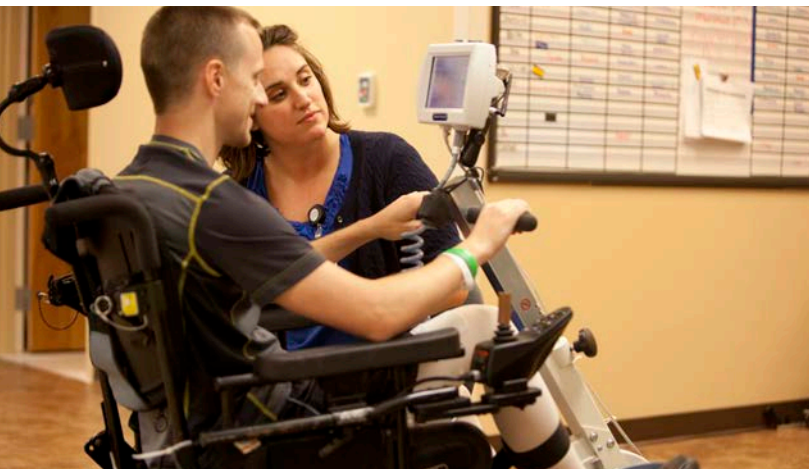
Restoring functional mobility — and improving strength — during the inpatient phase of rehabilitation is key. It sets the stage for outpatient rehabilitation and helps to make sure you maximize your potential.

In many cases, the family members or loved ones who will act as your caregivers will receive training as well, so they can assist you.

Outpatient Rehabilitation

Outpatient rehabilitation is critically important for people living with limb loss. It significantly helps your ability to return to your everyday life. Although your specific therapy program may vary, outpatient rehabilitation has several general goals:

1. Pre-prosthetic training and preparation: developing strength, balance, coordination and other skills you will need in order to use a prosthetic, or artificial limb, successfully.
2. Prosthetic training: walking, function and balance training for people who have had a lower-extremity amputation, and training for the coordination necessary to conduct activities of daily living (ADLs) for people who have had an upper-extremity amputation.
3. Wheelchair training: focusing on care and basic maintenance, safe transfers and community mobility skills.
4. A regular program of physical therapy to improve strength, coordination and balance and improve functional mobility.
5. A regular program of occupational therapy to improve functional ability to perform activities of daily living.
6. Functional independence improvement: depending on your specific condition, your rehabilitation team should help you expand your independence by giving you opportunities to practice different real-world scenarios. For example, an individual adapting to a lower limb prosthesis should practice walking on grass, sand and gravel in addition to smooth surfaces.
7. Support as you get back into the community, which can include ongoing support groups, introduction to wellness activities like adapted sports, returning to work and life skills such as driving.



AMPUTEE WALKING SCHOOL

University of Maryland Rehabilitation & Orthopaedic Institute is proud to sponsor Amputee Walking School, a special event held four times a year. Come practice your skills, learn new stretches and strengthening activities, and have fun. Led by Paralympic athletes Todd Schaffhauser and Dennis Oehler.

For information about the next Amputee Walking School, call 410-448-6802.

- ✓ The number of people with amputation who attended our Amputee Walking School increased **65 percent** between June, 2015 and June, 2016.
- ✓ Since we kicked off the Amputee Walking School program in 2014, University of Maryland Rehabilitation & Orthopaedic Institute has **doubled** the number of times we present the program each year, reaching more people with amputation, helping them increase their functional independence and reducing their sense of social isolation.

“I feel **empowered** and as though I have **gained** more control of my life. I feel better when I come here. My questions have been answered. I have learned to problem-solve.”

Amputee Walking School participant,
November 2016

Prosthetics

WHAT IS A PROSTHESIS?

The term prosthesis can refer to any artificial device that is intended to replace a part of the body, from heart valves to tooth implants. For people who have experienced limb loss, a prosthesis is generally an artificial hand, arm, leg or foot designed to replicate the lost limb in function and/or appearance.

WHAT TYPES OF PROSTHESES ARE AVAILABLE?

There are a variety of prosthetic devices on the market for people with limb loss. The type that is best for you depends on several factors, including what your mobility goals are and how you intend to use the prosthesis. Your doctor, prosthetist, and physical or occupational therapist will work with you to choose a prosthesis that is right for you.

UPPER EXTREMITY (ARM) PROSTHETICS: TERMS TO KNOW

- **Body-powered prosthesis:** this device enables the artificial limb to be controlled by the movement of your other arm via a harness and cable worn around your torso.
- **Cosmetic prosthesis:** a prosthesis designed to replicate a limb's appearance. These vary from a lifelike, custom-made cosmesis with freckles, veins, nails and hair to a silicone cover that mimics skin.
- **Myoelectric prosthesis:** this device connects to electrodes in your arm, which enables you to control the prosthesis with electrical signals generated from your own muscles.
- **Terminal devices:** hand attachments, which can take a variety of forms.
- **Transhumeral:** a type of prosthetic that attaches to your upper arm when the limb loss has included the elbow joint (i.e., above-the-elbow amputation). Compare to transradial, below.
- **Transradial:** a type of prosthetic that attaches to your arm below the elbow. Compare to transhumeral, above.

Our program participants report that our outpatient support, education and outreach programming has a positive impact on their lives.

- They report feeling 92 percent **less lonely, isolated or judged**
- They credit our programs with helping them gain a 90 percent **greater sense of empowerment and control**
- They are able to **improve their coping skills** by 85 percent
- They find it 93 percent **easier to talk openly and honestly** about their feelings
- They estimate that their depression, anxiety or fatigue is 84 percent **reduced**
- Our programs help participants develop a 93 percent **clearer understanding of what to expect**
- 98 percent report that they get **practical advice or information** from experts and peers during our programs



LOWER EXTREMITY (LEG) PROSTHETICS: TERMS TO KNOW

- **Foot-ankle assembly:** part of a leg prosthetic that provides stability for standing and walking. Specific structure and function can vary depending on whether they will be used for standing, walking, or running and jumping.
- **Transfemoral:** a type of prosthetic that includes an artificial knee joint and attaches to your thigh when the limb loss has included the knee (i.e., above-the-knee amputation). Compare to transtibial, below.
- **Transtibial:** a type of prosthetic that connects to your leg below the knee. Compare to transfemoral, above.
- **Shank:** lower leg section of the prosthesis with a solid structure. It may also have a cosmetic covering.
- **Socket:** connects to your natural leg and distributes weight and pressure evenly.

Prosthetic Timeline

Getting a prosthesis is not a single event. It is a collaborative, multistep process. Prosthetics are custom made for your individual limb as well as for your activity goals. It is important to work with an interdisciplinary team of experts who will consider your needs from all angles and help you navigate this crucial process. A certified prosthetist you can trust will be a part of this team.

To give you an idea of the steps involved in getting a prosthetic limb, here is a generalized timeline, starting from the surgical procedure:

Step 1) Wound healing after surgery. The time required for this step can vary.

Step 2) Limb shaping. After your wound has healed sufficiently during step 1, your doctor will clear you to use a compression sock to shape the residual limb in preparation for a prosthesis.

Step 3) Temporary prosthesis prescription and preparation. When your doctor decides you're ready, you will be prescribed a temporary prosthesis. Over the next 4 to 6 weeks, you will make several visits to your prosthetist's office to have a mold made of your limb and have adjustments made to the device.

Step 4) Begin physical or occupational therapy with your temporary prosthesis. Physical or occupational therapy is a key part of recovery in general — and of prosthetics in particular. Ideally, this occurs over 4 to 6 months of regular therapy.

Step 5) Gradually increase your prosthesis wearing schedule. At first, you will wear the prosthesis for short periods of time. Eventually, you will be able to wear it for the whole day.

Step 6) Permanent prosthesis prescription. Finally, you will be prescribed a permanent prosthesis. Because this is a long-term, custom-made device, you will get the best results by working with your whole rehabilitation therapy team. The same 4- to 6-week process of customization and adjustment takes place with your prosthetist, resulting in a custom-made artificial limb designed to fit your needs and goals. While the prosthesis is referred to as permanent, it's important to understand that people typically require more than one during their lifetime. This process of getting a prosthesis may occur a number of times over several years.



Patients recovering from amputation at our facility have an average inpatient rehab stay that is **30 percent shorter** than the national average.

ADAPTED SPORTS AT UM REHAB

Come Out and Play

The University of Maryland Rehabilitation & Orthopaedic Institute offers a wide variety of adapted sports activities for adults with limb loss (and other physical disabilities).

- Wheelchair rugby tournament team: Maryland Mayhem
- Adapted golf
- Wheelchair basketball
- Quarterly Amputee Walking School
- Yearly Adapted Sports Festival: connect with other adapted sports available in the area, from scuba and horseback riding to tennis and bocce. Held each September.



Secondary Prevention

For people who have undergone a non-traumatic amputation, preventing a second limb from being amputated is a major goal. People who have had a foot or leg amputated because of complications from diabetes or other vascular disease are at high risk of losing the other foot or leg for the same reason.

The good news is, your doctor, nurse and therapy team will work with you to help you prevent a secondary limb loss. Specific techniques can include foot care, diet modifications and medication adjustments to get underlying conditions — such as diabetes or peripheral arterial disease — under good control.

Life After Limb Loss

Losing a limb requires a major life adjustment. But there are many ways to get back to living a full life after limb loss. Support groups offer an excellent opportunity to learn from other members about how best to cope and adapt to life with an amputation.

SUPPORT GROUPS AT UM REHAB & ORTHO INSTITUTE

Amputee Support Group

Meets on 3rd Wednesday of each month
6:30-8 pm
Outpatient PT Gym, Rom G604
For more information: 410-448-6731

Caregiver Support Group

Meets on 4th Tuesday of each month
6-7 pm
SCI-CMR Gym, Room G615
For more information: 410-448-6311

Who's Who

Your care team consists of many members, each of whom focuses on a different aspect of your treatment and rehabilitation:

Nurse: a key part of the care team, nurses provide bedside care and patient education, addressing wound care, nutrition and medication management. They are also a rich source of information for both you and your caregiver, answering questions and modeling effective techniques.

Occupational therapist: a clinical expert who works with people who have lower extremity limb loss to maximize function and perform activities of daily living such as getting dressed, preparing meals, conducting grooming and hygiene activities, and regaining other skills necessary for home, work or school.

Surgeon (Vascular, Orthopaedic or General): a physician who performs the surgical amputation in a hospital's operating room (OR).

Physiatrist: a physician who specializes in physical medicine and rehabilitation. Physiatrists specialize in restoring optimal function to people with injuries to the muscles, bones, tissues or nervous system.

Physical therapist: a clinical expert who specializes in functional ability and strength which helps people physically recover and rehabilitate after surgery, illness or injury.

Prosthetist: a technical specialist in the design and function of prosthetic devices.

Recreation therapist: a clinical expert who helps people develop the physical, social and emotional skills to return to hobbies, leisure activities and the community.

Most of our acute rehabilitation patients are **discharged home** to continue their rehabilitation on an outpatient basis. 33 percent fewer patients are discharged to long-term care facilities as opposed to going home.



About the University of Maryland Rehabilitation & Orthopaedic Institute's Amputee Rehabilitation Program

The University of Maryland Rehabilitation & Orthopaedic Institute has a proud 120-year history of serving Baltimore and surrounding areas.

We are by your side throughout your journey, with individualized treatment plans designed around your goals and an interdisciplinary team approach to patient care. We guide you through the prosthesis process, with a dedicated team helping you choose a device that meets your needs. We look forward to a life-long relationship with our patients, working together to help you not just survive, but thrive after losing a limb.

We offer a range of specialized services for people living with limb loss, including:

- Adapted sports program, including the tournament-level wheelchair rugby team Maryland Mayhem, scuba, adapted golf and wheelchair basketball
- Advanced therapeutic technology
- Aquatic therapy at our on-site pool
- Amputee Clinic: an interdisciplinary clinic with a doctor, physical therapist and prosthetist all working with each patient
- Amputee support group on site
- Amputee Walking School
- Caregiver support group on site
- Integrative medicine (mind/body)
- Pain management
- Patient Navigator: appointment scheduling, medication coordination, records management and connection to program and community resources and support
- Recreation therapy
- Referral paths for Driving Rehabilitation and Vocational Rehabilitation
- Wheelchair seating clinic
- Wound clinic



UNIVERSITY *of* MARYLAND
REHABILITATION &
ORTHOPAEDIC INSTITUTE

Call us for a consultation

888-453-7626

For more information
visit us online at

UMRehabOrtho.org