Above Knee Amputation:
An Overview of Prosthetic Care

According to the National Limb Loss Information Center, in the United States there are approximately 1.7 million people living with limb loss. It is estimated that one out of every 200 people in the U.S. has had an amputation. The most common reasons for amputation are vascular complications (mainly diabetes), cancer and trauma. Regardless of the reason for your amputation, you are not alone. While your personal experience of limb loss is unique, many others have successfully overcome the loss or absence of a limb and regained function and a positive outlook.

The purpose of this manual is to provide a basic overview of prosthetic care from post-operative management and recovery to pre-prosthetic fitting and the delivery of your first prosthesis. There will be many questions along the way as you prepare for your life as an amputee and the best course to take is to communicate with those on your rehabilitation team. Your physician, physical therapist, occupational therapist and prosthetist are those who are here to help you become a successful wearer of a prosthetic device, but it is ultimately up to you to take charge of your care and your life as an amputee.

Post-Operative Management

There are several methods of post-operative care your surgeon may use, depending mostly on your level of health, condition of your residual limb and your potential as a prosthetic candidate. Typically, after surgery your surgeon will apply a dressing that is intended to reduce swelling and protect your limb. After the initial surgical dressing is removed, you may receive one of the following devices.

**Immediate Post-Operative Dressing** is placed on your limb in the operating room immediately after your surgery. The purpose of this dressing is for mild protection of your limb; keep any post-operative swelling under control and to allow for inspection of your incision. The surgeon’s initial dressing may vary and could be either a sterile post operative sock or an ace wrap bandage, both of which are wrapped over sterile dressing.

**Compression Socks or AK Shrinkers** are used to control edema and shape the limb. Compression is used in all post-operative devices but is also used alone in some cases. This is the minimal amount of post-operative management you may receive. Shrinkers may be in the form of an open-ended tube which is rolled onto your limb and then reflected at the bottom for a second layer and held in place with a hip belt; or a single layer sock that is stitched at the bottom. Either way it is important that you pull the sock snug to the bottom of your limb to reduce the chance of swelling.

**Transfemoral Preparatory Prosthesis** is a rigid co-poly plastic socket that is made from a model of your limb. This is usually done 3-5 days after your surgery. This is a device that is worn with compression and prosthetic socks which will allow a patient to begin gait training soon after surgery. This device has a waist belt for suspension, a manual-locking knee, a pylon and a single-axis foot. This device is usually prescribed for those patients who are more mobile and able to utilize the prosthesis soon after surgery.
The Rehabilitation Process

Rehabilitation begins soon after your surgery. You will work with physical therapy in the hospital and will most likely continue once you have been discharged. Typically, most people are fit with a prosthesis 6-8 weeks after surgery but it may take longer depending on your personal circumstances. Once you have been fit with your first prosthesis your physician will order out-patient therapy (at a rehab facility) or therapy can also be provided in the home if need be.

The Fitting Process

When your physician has given clearance to begin the prosthetic fitting, your prosthetist will take a plaster cast or a scan of your limb; this will provide him/her with a model to make your prosthesis. Prior to this appointment he/she will have assessed your individual needs and goals for life as an amputee. This includes, but is not limited to, determining how active you are or would like to be, your current weight, your occupation or leisure activities, your current health status (if there are other factors that may need to be accommodated), and the condition of your residual limb. This information is extremely important when determining the components and which type of prosthetic device is most suitable for you.

Check Socket and Component Selection

A clear plastic check socket is made from your model; this is what your prosthetist will use for the initial fitting. The check socket allows your prosthetist to make changes to the fit of the prosthesis or to change the alignment as you begin to walk. You will typically utilize the check socket for one to two weeks while you begin physical therapy. Your prosthetist will follow-up with you as well as your therapist to make sure the fit and function of your prosthesis is optimal and to address any issues immediately. As you become stronger, more flexible and confident on your prosthesis, your gait (the way you walk) will change and therefore your prosthetist will need to make changes to your alignment. Your check socket will consist of a clear socket, means of suspension, knee, pylon and a foot. The components that are used in your prosthesis are determined by your prosthetist.

Definitive Prosthesis

Once the fit of your prosthesis has been determined and no immediate changes are needed, your definitive (permanent) prosthesis will be made; typically this is after you have completed physical therapy. The time it takes to finish your prosthesis is usually four days, maybe longer if there is a protective cover applied. A definitive prosthesis is a much stronger and more durable version of the check socket you used in the fitting process. This socket is constructed of carbon fiber, nylon, resin and other materials that give it its strength. The look of your prosthesis can be as original as you are or it can be made to resemble your other leg. This means that the color and protective cover is shaped and finished to match your other leg as closely as possible.

Typically your limb will continue to change as you begin to wear your prosthesis more consistently. You will need to follow-up with your prosthetist regularly so that he/she can accommodate those changes. To become a successful wearer of a prosthesis it is best to follow the recommendations of your physician, prosthetist and physical therapist and it is imperative that you follow through with all appointments and call when you are having issues. If you are having pain or discomfort call immediately so that your prosthetist may remedy any problems before they worsen.
**Socket Design**

The prosthetic socket for a transfemoral amputee needs to support your weight, contain your tissue and your limb comfortably, and provide stability so that you can walk as efficiently as possible. Achieving a good fit is imperative to becoming a successful user of a prosthesis. The main pressures inside the prosthetic socket are absorbed by the bony anatomy of your pelvis (Ischial tuberosity), which are the bones you sit on and can feel when sitting on a hard surface.

**Suspension Techniques**

There are many ways to suspend a prosthesis. Some of the more common techniques are as follows: suspension uses a liner that is rolled onto your limb. This liner has a pin attached at the bottom and mechanism inside the prosthesis or a lanyard strap that attaches to the outside of the prosthesis. A liner that is rolled onto your limb but this design has a sealing ring, or rings, that seal against the prosthesis. A TES Belt is an alternative way of suspending a prosthesis. This is used typically in a preparatory and is a belt that attaches to the prosthesis and wraps around the hip on the opposite side of your technique that does not utilize liners or prosthetic socks. This technique is where the patient dons prosthesis with a pull sock and pulls themselves into the socket. Pulling in expels air inside the prosthesis way valve. This technique is used only with amputees whose limb is at a consistent volume.

**Prosthetic Knees**

Prosthetic knees today offer many different options for amputees of all levels. Depending on your level of activity and specific circumstances, your prosthettist will choose a knee that will provide you with what is most appropriate. A Manual Locking Knee is the most stable type of knee available. A Single-Axis, Constant Friction Knee is simple, inexpensive and lightweight. A Single-Axis, Constant Friction Knee with Stance Control has a breaking feature that prevents the knee from buckling when weight is put on the leg. A Single-Axis, Fluid Friction Knee varies its resistance as walking speed varies or when running. A Polycentric Knee is a very stable knee that allows for very fluid walking. A Microprocessor Knee is a computerized knee that responds automatically to the walking patterns of the patient and has added stability.

**Prosthetic Feet**

Prosthetic feet are categorized by levels of activity; this means how well you ambulate (walk.) Examples are: if you walk with an assistive device (walker or cane), if you can walk in varying speeds, or if you lead an active lifestyle and participate in sports or other recreational activities. The type of foot that is prescribed will vary. Other factors that determine the type of foot that is chosen are your body weight, if you walk on uneven surfaces, the type of job you have and the length of your residual limb. Prosthetic feet are categorized as: SACH (solid ankle cushioned heel), single-axis (one plane of movement), multi-axial (more than one plane of movement), and dynamic response (materials used in the foot return energy to the patient when walking). Speaking with your physician and prosthetist will help them make the best choices when constructing your prosthesis and will help you return to life as you knew it prior to your amputation.
Commonly Asked Questions

Q: How long after my amputation will I be fit with a prosthesis?
A: Most people are fit between 6-8 weeks after surgery; this may vary person to person. Your limb needs to be completely healed before the fitting process can begin.

Q: Why do I need compression socks and how long will I need to wear them?
A: Compression is imperative to shaping your residual limb and keeping the edema (swelling) under control. It is recommended that you wear your compression socks until there is little change in the volume of your limb from day to day. Once you are wearing your prosthesis daily, you may only need to wear compression at night if at all.

Q: What is involved in the casting process?
A: When you first meet with your prosthettist for the casting, he/she will take a set of measurements and note the important features of your limb. Your prosthetist will apply layers of plaster of paris to obtain an impression of your limb which will then be filled with plaster. This provides a model for which your check socket will be made. Once the proper modifications are made, a technician will construct the check socket and this takes approximately four days to produce.

Q: What can I expect at the initial fitting of my check socket?
A: The first fitting is done in the office or sometimes at your first physical therapy appointment. It is important that you wear loose, comfortable clothing. Your prosthetist will explain how to don (put on) and doff (take off) your prosthesis, how to care for it, and provide a wearing schedule for you to follow. You will also learn how to modify the fit of your prosthesis with prosthetic socks and what to look for when you check your limb frequently. Proper alignment is attained while you walk inside the parallel bars and before you leave the office, your check socket is reinforced for added strength. The check socket is utilized for 1-2 weeks before your definitive (permanent) prosthesis is made.

Q: How often will I be seen for physical therapy?
A: Typically you will see your physical therapist 2-3 times per week but it is ultimately up to your therapist and physician to determine how many times per week and for how many weeks.

Q: Once I receive my definitive prosthesis, how often will I see my prosthetist?
A: You will need to follow up with your prosthetist often after the delivery of your definitive prosthesis. As you continue to wear your prosthesis more often and become active again, your limb will change in shape and size and your prosthetist will need to make changes to your socket to accommodate those changes. If you are having pain or discomfort at any time, you will need to see your prosthetist immediately.

Q: Will I be able to participate in the sports or leisure activities I did prior to my amputation?
A: Yes! As long as your physician agrees, you should be able to return to the activities you enjoyed prior to your surgery. Prosthetic components today offer the amputee a variety of options that make participation in recreational activities possible. Be sure to express this to your prosthetist so that the proper components can be selected for your prosthesis.

Q: Where can I go for more information?
A: Below you will find a list of organizations, literature and websites you may find helpful. Remember, your rehabilitation team is still the best source for information.
Resources for People with Amputations

Websites

- Orthotic and Prosthetic Assistance Fund. www.opfund.org
- The Global Resources for Orthotics & Prosthetics information. www.oandp.com
- For families and friends of children with limb differences. www.limbdifferences.org
- Surviving Limb Loss. www.survivinglimbloss.org
- Amputee Information Network. www.limbless-association.org
- Online magazine for Amputees. www.amputee-online.com/amputee
- For female amputees. www.ladyamp.com
- Active Living Magazine. www.activelivingmagazine.com
- National Center of Physical Activity and Disability. www.ncpad.org

Books


If you have any further questions or comments please feel free to call Comprehensive Prosthetics and Orthotics and speak with a Certified and Licensed Prosthetist. We would appreciate the opportunity to provide the most up to date and effective prosthetic care that can only be given by those who truly care about your health and well-being.

If you have any questions, please contact Comprehensive Prosthetics & Orthotics.

Your prosthettist is:________________________________________

Your physician is:________________________________________

Location:_______________________________________________

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