AMPUTEE RESOURCES

Amputee Online  www.amputee-online.com
Coalition of America  www.amputee-coalition.org
Golf Association  www.wagagolf.org
World Limb Bank  www.limbbank.org
O&P Village Online  www.oandpvillage.com
O&P Online  www.oandp.org
Limbless Association  www.limbless-association.org
Disabled Sports  www.nscd.org
Prosthetic Outreach  www.pofsea.org
AOPA  www.aopanet.org
Challenged Athletes Foundation  www.challengedathletes.org

Headquarters
1700 N. Chrisman Road
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Dear Patient:

This booklet was created as a resource for you and your family. By reading through this, you will gain a broad understanding of the processes and procedures you will go through from the time of your amputation and throughout your prosthetic fittings.

Pacific Medical Prosthetics and Orthotics understands that you are going through difficult times that are sure to test your physical and mental being. Rest assured you are not alone as our staff of professionally trained Practitioners are here to help and serve you. Our vast resources and knowledge give us an advantage in helping you find the light at the end of the tunnel.

We look forward to working with you and providing the highest quality of products and services in a positive atmosphere.

We will always be happy to address your questions and concerns, so please feel free to contact us at any of your local patient care facilities.

Sincerely,

The Practitioners & Staff of
Pacific Medical Prosthetics & Orthotics

Pacific Medical Prosthetics & Orthotics hopes this guide has helped address some of your questions and concerns regarding prosthetic care.

Our professional staff will always be available to answer your questions in greater detail. Feel free to schedule a “one on one” prosthetic consultation at any time.

We look forward to meeting you and helping you achieve your goals.
Wash your prosthesis daily with a mild cleanser and dry thoroughly.

Avoid submerging your prosthesis under water.

If your prosthesis comes into contact with salt water, rinse with fresh water.

Do not adjust any screws or bolts on your prosthesis. Consult your Prosthetist.

If you notice that part of your prosthesis is becoming loose, contact your Prosthetist.

Never apply lubrication to your prosthesis.

If you hear any cricking, cracking, squeaking or grinding noises in your prosthesis, contact your Prosthetist immediately.

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PRE-PROSTHETIC CARE

This is an overview of the procedures that you will be going through. It is important that you realize this is just a guide and each experience is different for each patient. This is intended as a tool to get you acquainted with typical prosthetic procedures.

Surgery
Unless you are a congenital amputee, meaning you were born without an extremity or a portion of your extremity, a surgical procedure will be performed to remove the affected limb. Your surgeon will perform the appropriate amputation resulting in a healthy and viable residual limb.

Post-Operation
During the healing process there is inflammation and initial swelling that will need to subside before a prosthetic fitting is possible.

Shrinker
A shrinker is a compression garment that may be prescribed to decrease volume and protect your residual limb prior to prosthetic intervention. Shrinkers can be rigid or soft.

PROSTHETIC SOCK INSTRUCTIONS

If your prosthesis does not use suction suspension, prosthetic socks can be used to cushion and adjust the volume of the socket. Prosthetic socks are available in several materials including wool, cotton, and synthetics. Sock thickness is measured by the “ply” rating, most commonly from 1-ply to 6-ply. By varying the ply number and/or the number of socks worn, amputees can adjust for changes in the size of their residual limb.

Volume Management
Keep extra prosthetic socks with you at all times as your volume may fluctuate throughout the day.

When applying prosthetic socks be sure to work out all wrinkles, to decrease skin irritation.

If your prosthesis is fitting loose, add sock ply until you have achieved a firm socket fit.

If you apply too many prosthetic socks you will be unable to enter your socket completely.

Clean socks daily according to manufacturer directions.
Applying a hypo-allergenic antiperspirant to the residual limb can help you control odor and perspiration. Do not apply antiperspirant to any open wound.

Do not use alcohol-based products on your residual limb. They dry out the skin and can contribute to cracking or peeling.

Do not shave your residual limb. Pressure from the prosthetic socket on “stubble” can cause in-grown hairs that become painful and even infected. Never use chemical hair removers on your residual limb.

As your residual limb is healing, there are four techniques you can use to prepare your residual limb for prosthetic training: massage, tapping, desensitization and scar mobilization.

**Massage**
Massage your entire residual limb using a gentle kneading motion, be especially cautious over the sutured area. Once your sutures are removed, you can increase the pressure to massage the deeper soft tissues and muscles in your residual limb. This should be done for at least 5 minutes 3 to 4 times daily.

**Tapping**
Tap your residual limb with your fingertips, be careful not to tap with your fingernails. Gentle tapping over the suture line is generally allowed even before your sutures are removed. Once your sutures are removed, you can increase to a slapping motion. Tapping should be done for 1 to 2 minutes 3 to 4 times daily.
Desensitization
This technique is done directly on your skin. Start with a cotton ball and gently rub the skin of your residual limb using a circular motion. Progress to a rougher material as tolerated such as a paper towel. Finally, advance to a terry cloth towel.

Scar Mobilization
Once your incision is healed (stitches have been removed), place your fingers over the suture line. Press firmly and move your fingers in a circular fashion across the suture for 1 minute. This should be done for 2 to 3 minutes twice daily.

RESIDUAL LIMB HYGIENE

Once your residual limb is completely healed, wash daily with mild soap and rinse thoroughly.

Dry skin by patting it with a towel. Be sure the residual limb is completely dry before putting on the prosthesis to decrease friction and bacterial growth.

Consult your Prosthetist before using moisturizing creams or lotions. Vaseline or petroleum-based lotions degrade some types of prosthetic liners. If a moisturizing lotion is needed, it is best to apply it when the prosthesis is not being worn for several hours. Do not apply lotions to any open wound.
Following Up
While you are learning how to use your new prosthesis, weekly follow-up appointments with your Prosthetist will be required for adjustments. As you become a more competent walker, alignment adjustments will optimize your progression in therapy. In addition, comfort and fit of the socket may change over time, requiring additional modifications.

Definitive “permanent” Prosthesis
Soon your residual limb will mature and volume will stabilize. At this time, construction will begin on your new permanent prosthesis. Definitive prostheses are unique and are intended to last multiple years and utilize higher level components. In addition, they can be cosmetically shaped to your anatomy.

Shrinkers are used to reduce swelling (edema) by providing even pressure over the soft tissue of the residual limb.

- Holding your knee straight, turn the shrinker inside out and stretch it open to contact the end of your residual limb.
- Stretch and pull the lower (distal) half of the shrinker firmly up then let the material relax. This should ensure maximum compression at the end.
- The top (proximal) half of the shrinker can now be pulled up into position.
- To decrease skin irritations make sure there are no wrinkles in the shrinker.
- Shrinkers tend to slide down and should be checked regularly.
- If your shrinker has a waist belt, firmly fasten the velcro closure to prevent it from sliding down.
- If redness or other signs of excessive pressure occur, discontinue use and contact your Prosthetist.
**Initial Visit**
Once your residual limb is healed and volume (swelling) is stabilized, you will meet with your Prosthetist (Practitioner) for an initial evaluation.

**Casting**
During the first visit you will be casted by your Prosthetist. The casting allows the Practitioner to design a prosthesis that is customized to your residual limb as well as your personal needs and comfort.

**Check Socket**
After the casting you will be fit with a check socket. A check socket is a transparent prosthesis that allows us to see how your residual limb fits in your customized socket. These sockets are easily modified to maximize function and comfort.

**Preparatory Prosthesis**
Once an appropriate check socket fit has been established, your Prosthetist will construct your preparatory prosthesis. Preparatory prostheses are typically used for six months to one year and allow your residual limb to mature and volume to further stabilize.

**Personal Care**
Your Practitioner will provide you with instructions on residual limb hygiene, cleaning your prosthesis, and prosthetic sock use.

**Alignment**
Upon delivery of your prosthesis, your Practitioner will perform linear, angular, and height modifications to your new leg. Proper alignment allows more natural gait (walking) and function. *Note: Maintenance and mechanical adjustments should only be performed by your Prosthetist.*

**Training**
Learning to use your new prosthesis involves the whole rehabilitative team. Often your Physician will prescribe physical therapy. Your Physical Therapist will work on increasing your strength and ability to ambulate (walk) more naturally. Your therapist will also teach you how to utilize your new prosthesis for specific activities.
Dynamic Response “stored energy” Foot
- Ideal for the high activity amputees
- Puts spring in your step by storing energy during walking
- Amount of spring increases as cadence or activity level increases

Hybrid Foot
- Appropriate for high activity users and athletes
- Combines features of multiple feet. For example, a multi-axial dynamic response foot
- Some incorporate shock and rotation units to allow for absorption of impact and torque

During your initial evaluation your Prosthetist will create a blueprint of your new prosthesis. To optimize function and customize the prosthesis, many factors are considered in the design.

- Health
- Skin condition
- Allergies
- Height
- Weight
- Activity level
- Hobbies
- Goals
- Occupation
SACH Foot
(Solid Ankle Cushioned Heel)
- Simple, reliable, and good for short-term or low-activity amputees
- Provides shock absorption at impact

Single Axis Foot
- For amputees with short residual limbs, weak muscles, and knee instabilities
- Appropriate for individuals whose major concern is stability

Elastic Keel Foot
- Good for general purpose use, especially for older amputees
- Allows for smooth roll over while walking

Multi-Axial Foot
- For active amputees
- Allows prosthetic foot to adapt to uneven terrain

There are many component options in a trans-tibial prosthesis which will be discussed in detail on the following pages.
Socks
These can be made of cotton, wool, and or spandex. Socks are primarily used to counter fluctuations in residual limb volume but cannot be used with suction socket suspension.

Liners
There are many liner materials used in prosthetics, profolex being the most popular. Liners absorb forces, allow for adjustment, and can accommodate abnormally shaped residual limbs.

Gel Liners
This form of interface comes in many materials such as urethane, thermo-plastic polymer, and silicone. Liners absorb direct pressure and shear “rubbing” forces that occur between the socket and the residual limb.

Suspension is the mechanism that holds the prosthetic limb to your body. There are many options for suspension.

Straps
This includes anything that is attached at specific points on the prostheses then attaches to a higher point on the body, typically the thigh or waist.

Sleeves
These rely on an adhesion to the prostheses and the limb above the prostheses. Typically, these are used alone but may be used in a suction suspension system.

Suction
A strong seal is created between the limb and the socket. This can be done by sealing the socket with a sleeve or by utilizing a one-way air valve in the socket.

Supracondylar
By compressing the tissue above the knee, it is possible to create an anatomical socket lock.
There are two forms of liner suspension:

**Pin Lock**
By using a pin in the bottom of a form fitting gel liner, a mechanical locking receptacle can be incorporated into the socket. When the amputee applies the socket, the locking mechanism engages with the liner and suspends the limb. With the push of a button the amputee can disengage the pin lock mechanism to remove the prosthesis.

**Lanyard Lock**
By using a lanyard “chord” in the bottom of a form fitting gel liner, a mechanical locking receptacle can be incorporated into the socket. When the chord pulls the residual limb into the socket, the locking mechanism engages with the liner to suspend the limb. With the push of a button the amputee can disengage the lanyard lock mechanism to remove the prosthesis.

**Socket**
Custom made sockets are the link between the residual limb and the prosthesis. A composite material is used to make the socket strong and light. Composite material is comprised of:

- **Reinforcement Materials** - This is the strong inert material that supplies a majority of the strength and stiffness of the composite. These are usually materials with long fibers such as glass, carbon, nylon, etc.

- **Matrix Material** - This is the glue which binds the reinforcing materials together so that they can transfer forces and work as one unit.

**Components**
These lightweight pylons and adapters connect the prosthetic foot to the socket. They also allow for angle and height adjustments.