

optimus  
PROSTHETICS

Patient  
Education  
Packet

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# WHAT MAKES UP A PROSTHESIS?



## Liner

The first component of a prosthesis is usually a gel liner. The liner is designed to be soft and stretchy so it can be rolled onto the residual limb and help protect your skin from the rigid socket. For some mature limbs, a liner is not used. The liner also acts as a suspension mechanism for the prosthesis via lock and pin, suction, or vacuum system.

## Suspension Sleeve

The sleeve is used on suction and vacuum suspension systems. The sleeve is secured to the outside of the socket and pulls up over the socket and liner to maintain an airtight seal.

## Socket

The socket is the rigid frame that was custom molded to fit your residual limb. The socket is made out a variety of materials such as carbon fiber, nyglass and felt. These materials are laminated together by an acrylic resin that “glues” and hardens the material, making it very durable yet lightweight. Often, a thin flexible inner socket is also used for comfort.

## Foot

The prosthetic foot is designed to maximize energy efficiency and stability when walking.

## Components and Adapters

Various other components help connect the prosthesis together. An aluminum or carbon fiber tube called a pylon stands between the socket and the foot allowing for height adjustments when needed. Other connecting parts and adapters are critical for the alignment of the prosthesis.



## TRANSTIBIAL (BK) ELEVATED VACUUM

The suspension technique used to hold your prosthesis on is called elevated vacuum. When the prosthesis is put on, air within the socket is actively pulled out by either a mechanical or electric vacuum pump. An outer sleeve seals off the socket to any air, creating negative pressure inside the socket which holds the prosthesis on.

### DONNING

1. Turn the liner completely inside out.
2. Roll (do not pull) the liner onto your residual limb, **making sure that the bottom of the liner is in contact with the very end of your limb**. Leave 2-3" of the liner folded over on itself with the gel side out.
3. Roll the sleeve down the outside of the socket, and then pull on the prosthesis or step into it.
4. Before taking any steps, pull up the sleeve onto your thigh. The sleeve should cover the reflected liner and continue onto the thigh.
5. For electric pumps, turn on the pump and set your preferred vacuum level. For mechanical pumps, put weight through the prosthesis to increase the vacuum level.
6. To take off your prosthesis, turn off your pump (if electric), and then pull down the sleeve past your knee. You can then push off the prosthesis.



### HELPFUL TIP

If your pump begins to run more frequently or continuously, there may be a hole in the outer sleeve. Contact your prosthetist to swap out to a new sleeve. If you have a spare sleeve at home, remember to bring it to your appointment.

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## LINER CARE

### WHAT IS THE LINER?

The gel liner acts as a barrier to cushion and protect your limb from the applied forces within the socket. It also often incorporates the suspension method to hold your prosthesis on. Since the liner is in direct contact with your skin, it is prone to getting dirty and damp (due to sweat). Proper hygiene is extremely important to prevent infection, bacterial growth, and skin irritation.

### WASHING INSTRUCTIONS

The liner should be washed **daily** (the best time is at the end of the day before bed).

1. Turn the liner inside out (gel-side facing out).
2. Wash the gel using mild, anti-bacterial soap and warm water. Be sure to remove all residue and dead skin.
3. Pat dry with a lint-free cloth or towel.
4. Return the liner right-side out (fabric on outside) and hang to dry on liner stand.
5. Allow the liner to dry completely before wearing again.





## LINER AND SOCKET HYGIENE

### LINER HYGIENE

- ❑ To reduce the risk of skin irritation, **DO NOT** trim your liner. Dull scissors can leave a harsh edge that may cause skin irritation. Contact your prosthetist if you would like your liners trimmed shorter.
- ❑ Always store your liner right-side out. The gel should be on the inside and the fabric side facing out (as if you were wearing it). This will prevent the gel from cracking and also prevent the build-up of dust or hair. Ask your prosthetist for a drying stand if you need one.
- ❑ Inspect the inside of the liner for tears, cracks, foreign or embedded objects before putting it on. If tears or cracks are found, please notify your prosthetist.
- ❑ For sensitive skin: apply a light coat of baby oil on the knee cap, behind the knee, or at the end of your tibia to reduce rubbing of the liner between your skin.



### SOCKET HYGIENE

- ❑ Periodically scrub your socket inside and out with warm soapy water and dry with a towel. Allow the socket to dry completely before wearing.
- ❑ Report any cracks, chips, or noises to your prosthetist as damage to the socket can affect the safety of the prosthesis.



# PROSTHETIC SOCKS

Prosthetic socks are to be used for daily volume fluctuations of your residual limb. Due to the trauma from surgery, other medical issues (i.e. diabetes, vascular disease, heart disease), or increased activity, your residual limb may lose or retain fluid. Prosthetic socks are worn **over** the gel liner to take up extra space in the socket and allow it to fit properly.

## HELPFUL TIPS

- It should take a little effort to settle into your socket. If it goes on effortlessly and settle quickly to the bottom, this is a sign that you should try adding a sock.
- Begin with the thinnest sock and increase as necessary to create a snug fit.
- Be sure that the sock is clear of the pin so it does not obstruct the pin from engaging with the lock.
- Machine wash the socks regularly to keep clean of dirt, skin oils, and sweat.



### **Prosthetic socks come in 4 thicknesses ('plys'):**

No Stitching/Tan.....1 ply

**White** Stitching.....2 ply

**Yellow** Stitching.....3 ply

**Green** Stitching.....5 ply



## SOCK GUIDE

### DO I NEED TO ADD A SOCK?

#### Warning Signs of Wearing TOO FEW Socks:

- Pressure on or below knee cap
- Pressure on the end of your limb
- Redness over bony areas
- Gapping between sides of socket
- Feeling of movement or instability within the socket
- Your socket spins or your limb or your foot rotates while walking
- Height feels short on prosthetic side/sudden onset of back pain



\*If adding sock(s) does not resolve the issues you are having, call your prosthetist for an adjustment.

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### DO I NEED TO REMOVE A SOCK?

#### Warning Signs of Wearing TOO MANY Socks:

- Pressure on sides of your knee
- Gapping between end of limb and bottom of socket
- Excessive difficulty putting on your prosthesis
- Feeling of strangulation or numbness in your limb
- Firm, red skin and/or blisters at the end of your limb
- Height feels tall on prosthetic side/sudden onset of back pain

\* If removing sock(s) does not resolve the issues you are having, call your prosthetist for an adjustment.

- Socks come in different sizes and thicknesses.** As your volume changes throughout the day, you may need to add or remove a sock. *Socks can be layered atop one another, if necessary.*
- Your volume may change due to a variety of reasons.** Your medical history, medications, diet/salt intake, exposure to heat, activity level, frequency of wear, and shrinker use can all affect the volume of your residual limb.
- Always carry socks with you!** If you carry a purse, keep some socks in there. If you don't carry a purse, buy a bag to carry with you. If you have a car, put socks in your glove compartment or center console. Keep a stash in your desk at work. Make sure socks of varying plies are easily accessible to you throughout the day.



## SKIN CARE

Unfortunately, sores and skin irritation are not uncommon among amputees. Always check your skin before and after prosthetic use and follow these guidelines to take care of your skin.

### **DAILY SKIN CARE**

- ❑ Every day, or more often if necessary, wash your residual limb with a mild, antibacterial soap and lukewarm water. Rinse thoroughly with clean water to remove all soapy residue.
  
- ❑ Dry your skin by patting it with a towel. Be sure your residual limb is completely dry before putting on your prosthesis. Allowing 15 minutes of air-drying before applying your prosthesis should ensure that the skin is thoroughly dry.
  
- ❑ Consult your prosthetist and/or physician before using any creams or moisturizing lotions. Vaseline or petroleum-based lotions may degrade certain liner types. Only use softening lotions when your skin is at risk of cracking or peeling. If a moisturizing lotion is needed, it is best to apply it at night to allow it to soak into your skin. Do not apply lotions to any open areas on your residual limb.
  
- ❑ If needed, applying an antiperspirant to your residual limb can help control perspiration beneath the liner. Do not apply antiperspirant to any open areas on your residual limb. Consult your prosthetist for a list of antiperspirant recommendations.
  
- ❑ Gentle massage and light tapping of your residual limb will help desensitize the limb and prepare it for your prosthesis. This is especially important for new amputees. You can increase pressure as your limb heals, but do not be overly aggressive. Consult your prosthetist or physical therapist with any questions.



## SKIN CARE

### INSPECTION OF YOUR RESIDUAL LIMB

- ❑ Regular inspection of your residual limb using a long-handled mirror will help you identify skin problems early.
- ❑ Initially, inspections should be done whenever you remove your prosthesis. Later on, most amputees find daily inspection sufficient for the early identification of skin problems.
- ❑ Inspect all areas of your residual limb. Remember to inspect the back of your residual limb, the back of your knee, and all skin creases and bony areas.
- ❑ Look for any signs of skin irritation, blisters, or red marks that do not fade within 15 minutes of removing your prosthesis. Report any unusual skin problems to a member of your rehabilitation team and contact your prosthetist for an adjustment.



### THINGS TO AVOID

- ❑ 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 the hair to grow inward, become painful, and in the worst cases, become infected. Never use chemical hair removers on your residual limb.
- ❑ Avoid prolonged soaking in warm bathtubs or hot tubs because this may cause your residual limb to swell.



## DAILY FOOT CARE

For lower-extremity amputees, it is important to maintain the health of your sound foot. This is especially important if you have diabetes, decreased circulation, or neuropathy (poor sensation) in your lower extremities.



### **YOUR DAILY ROUTINE SHOULD INCLUDE THE FOLLOWING:**

**Wash and dry your foot properly.** Use a mild soap, rinse thoroughly, and dry your skin by blotting or patting, making sure to dry between your toes.



**Inspect your foot daily.** Check for blisters, cuts and cracking, pressure areas, redness, irritation, skin breakdown, pain, or edema (swelling).



**Protect your foot from injury.** Wear shoes or slippers at all times, and check your shoes every time you put them on for tears, wrinkles, rough edges, or sharp objects.



Contact your physician or prosthetist with any concerns.



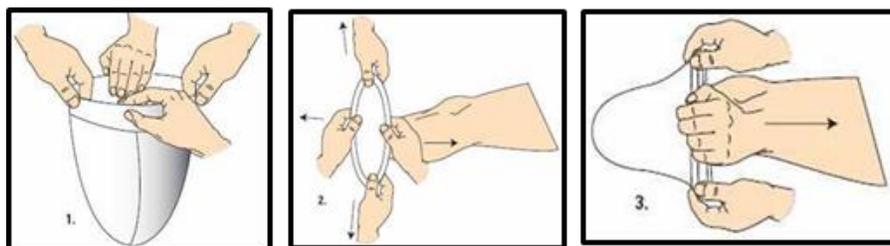


## SHRINKER USE

Shrinkers are designed to help control edema (swelling) within your residual limb by applying compression to your limb. The compression helps push the fluid within your leg away from your residual limb. Until the volume of your residual limb has stabilized, you should wear your shrinker any time you are not wearing your prosthesis (including at night).



### HOW TO PUT ON A SHRINKER



1. Ensure the shrinker is right-side out (silicone beads at edge are on inside of shrinker).
2. If another person is available, pull on opposite sides to ease the shrinker over your residual limb. If donning alone, pull on either side of the shrinker and ease over your residual limb.
3. Pull the shrinker up over your limb and smooth out all wrinkles.

### FAQs

#### ***What if my shrinker slides off?***

Shrinkers will have a tendency to do this, especially at night as you move around while you sleep. Simply pull the shrinker back up. You may contact your prosthetist for a smaller size if the shrinker is excessively large.

#### ***What if I can't fit into my leg?***

Often, if you neglect to wear your shrinker, especially at night, your limb will swell up and make it difficult for you to fit into your prosthesis. Put on the shrinker to apply compression to your limb for several minutes, then try putting your prosthesis back on.



## IMPORTANT POINTS

When used properly, your prosthesis can help you walk and live more independently. Follow these important points to ensure your success:

- ❑ Catch any issues early. Contact your prosthetist at the first sign of problems.
- ❑ Know your limb — be able to recognize when something unusual occurs (red spots, discoloration, tough skin, etc). While mild redness is normal after removing your prosthesis, deep redness or redness that doesn't subside after 15-20 minutes should be addressed by your prosthetist.
- ❑ While wearing the prosthesis, your skin may experience adverse effects like blisters, rashes, sores, etc. When this occurs, immediately remove the prosthesis and contact your prosthetist.
- ❑ Report any malfunctions, failures, or needed repairs to your prosthetist immediately.
- ❑ If there is a significant change to your health condition or weight loss or gain of more than 10 lbs, contact your prosthetist.
- ❑ Repairs on the prosthesis are under warranty for 3 months from the date of delivery. Individual components may have different warranties. Ask your prosthetist for details.
- ❑ Follow up appointments are important and will occur frequently after initially receiving your prosthesis. Regularly scheduled follow up appointments are then suggested every 3-6 months to monitor your progress. It is important to keep these appointments, as they will allow your prosthetist to ensure you sustain maximum comfort in your prosthesis.



## GOING ON VACATION

Be prepared! Here is a quick checklist of some things you may want to remember:

- ANTIBACTERIAL CREAM** – You may be walking more and, as a result, may develop sores from the increased activity. Antibacterial cream will help keep any sores clean.
- DUCT TAPE** – To temporarily hold together a broken strap, belt, or other part of your prosthesis.
- SET OF HEX WRENCHES AND LOCTITE** – To tighten any bolts that may come loose (most common is 4, 5, and 6 mm).
- PLASTIC BAGS** – To keep your prosthesis dry when there is a threat of it getting wet.
- PROSTHETIC SOCKS** – To adjust for changes in volume on the go; clean socks are always nice to have in hot weather or after times of increased activity.
- SPARE LINER** – In case your liner gets damaged or lost.
- SPARE SUCTION VALVE** – In case suspension is lost or your valve is not working properly (not applicable to all prostheses – contact your prosthetist if you are unsure).
- PHONE NUMBER OF YOUR PROSTHETIST** – In case of an emergency.
- CHARGER** – If your prosthesis requires it to charge your vacuum pump, microprocessor knee or foot. Be sure to bring the appropriate adapter if travelling out of the US.

***NOTE: If you will be on vacation for an extended period of time, ask your prosthetist for recommendations of a local prosthetic facility in case you need adjustments or repairs.***