

ABOVE KNEE (TRANSFEMORAL) PROSTHESIS TERMS & TROUBLESHOOTING

The following information is to be used only as a tool for learning. If at any point you have a question or are unsure of what to do, please call your local Westcoast Brace & Limb facility to speak with an Amputee Case Manager or Certified/Licensed Prosthetist.

Anatomical Terms

1. Femur- this is the only bone in the thigh.
2. Hip Extension- this refers to the hip being in a *straight position*. When you stand up, your hip goes from flexion (bent) to extension (straight down). It can be achieved by pulling your leg towards your back.
3. Hip Flexion- this refers to the position of the hip when it moves from a straight position to a *bent position*. While sitting in a chair, your hip is in flexion. When standing, this motion is achieved by moving the leg forward.
4. Ischial Tuberosity (IT)- commonly referred to as your "seat bone." This is the bone that is noticeable if you sit on a hard surface or a bike seat.
5. Trochanter- this is part of the femur. It is the bone that you feel on the side of your hip.

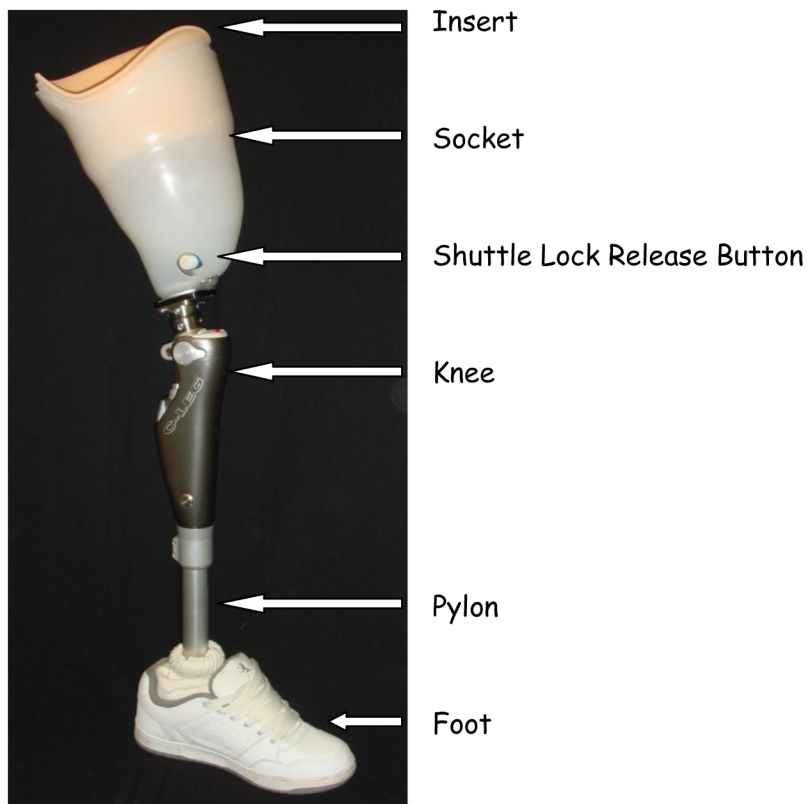
Anatomy of Prosthesis (See Diagram on the next page)

1. Socket- The custom fabricated hard piece that encompasses your residual limb
2. Pylon - Attaches the prosthetic knee to the foot. Sometimes attached the prosthetic socket to the knee as well.
3. Knee - The artificial mechanical knee that mimics similar motion to an anatomical knee. Many different types. Your prosthetist will help determine the best type for you.
4. Foot - The artificial prosthetic foot at the end of your prosthesis. Many different types exist. Your prosthetist will help determine the best type for you.
5. Liner - This is usually a roll on Silicone or Urethane liner. This goes directly against your skin. It may or may not have a pin or strap attached to the outside bottom of the liner.
6. Insert - This is inside your prosthetic socket. It may be made of a flexible plastic or foam.

Other Prosthetic Terms

1. Piston- the sensation that your residual limb moves up and down in your prosthetic socket as you raise and lower your leg. This indicates poor suspension.
2. Plunger or locking pin- This piece attaches to the roll-on liner and allows the liner to lock into the shuttle lock at the bottom of the prosthetic socket for suspension.
3. Ply- a term used to signify the thickness of a prosthetic sock. One ply is approximately the thickness of a thin cotton sock.

4. Shrink - a term used to refer to a residual limb that is decreasing in size. Shrinking of the muscles or soft tissue is especially common with a newly amputated limb.
5. Shrinker- an elastic stocking applied to the residual limb to help shape the limb and reduce/control swelling. This is worn whenever the prosthesis is *not* being used.
6. Shuttle lock - The lock that is in the bottom of the prosthetic socket. The roll-on sleeve with a locking pin connects here for suspension of the prosthesis.
7. Suspension- how the prosthesis is held onto your residual limb. The most common types are:
 - a. 3S - Silicone suction suspension: Uses a roll-on sleeve with a locking pin or a pull strap on the end. The locking pin inserts into a shuttle lock that is attached at the prosthetic socket. A pull strap would feed through a slot in the bottom of the socket and attach onto the outside of the socket.
 - b. Straight suction: the residual limb makes direct contact with the entire socket. There is a small valve at the end of the socket that allows air to escape creating a vacuum effect and thus the prosthesis is held in place on the residual limb.
 - c. Vacuum: uses a roll-on sleeve on the residual limb and a pump connected to the socket to draw out the excess air and create a vacuum/suction suspension of the prosthesis.
 - d. Partial suction + silesian belt: Combines the small valve at the end of the socket with a lightweight, adjustable belt that secures around the waist and attaches to the front and top of the prosthetic socket. Allows the use of a prosthetic sock when needed.
 - e. Hip joint, pelvic band, and waist belt: A metal joint that is attached to the outside top of the prosthetic socket. It is attached to a metal pelvic band, which is shaped to fit your waist on the amputated side. This is then attached to a leather belt that circles the entire waist. This may be used with an AK amputee who has weak hip musculature or has a very short residual limb.



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TROUBLESHOOTING

It is important to remember that your prosthetic socket does not change unless your Prosthetist makes a physical change to it. However, your body and/or your residual limb may change in shape or in size. This can be affected by diet, weight gain/loss, dialysis, swelling increase/decrease, activity, etc. Your prosthetic socket is designed to fit the unique shape of your residual limb. If the shape of your residual limb has changed or your limb is not positioned correctly in the prosthetic socket, it can cause discomfort. Below are some common problems you may encounter and some solutions (where applicable). Be sure to call your Westcoast Brace and Limb Prosthetist if you are unable to resolve the problem, if you have pain, and/or instability.

Socks

Socks are used to help adjust the fit of your prosthesis on a daily basis. If you begin to experience discomfort, this should be the first thing you assess. First check to ensure you put the prosthesis on correctly (not rotated), if this is okay, then the size of your residual limb may have changed. In most designs, with the exception of straight suction, you can begin to add or remove prosthetic socks to/from the residual limb. Use more or less socks until you feel comfortable.

Problems from wearing TOO many ply of sock

- You feel like the prosthesis is too tall (taller than normal)
- Your Residual limb throbs, feels constricted, and/or choked.
- The bottom end of the limb becomes red/purple in color and moist/weepy.
- Instability side to side

Problems from NOT wearing enough ply of sock

- Uncomfortable pressure in these areas:
- The groin
- Ischial tuberosity (sit bone)
- The bottom, outside, or front end of the femur
- Increased instability and pistoning
- Prosthesis may rotate/spin. The foot will look like it's too far in or too far out.
- Feeling that the prosthesis is too short

Footwear

Your prosthesis was designed/aligned to be vertical when it is in your shoe. Unless you have an adjustable heel height foot, you will need to choose shoes that all have a similar heel height. You may notice one of the following situations if you change your shoes and the heel height is not the same as what was originally used:

- If the prosthesis leans forward in the new shoes than the heel height is **too high**. This can cause the prosthetic knee to be pushed forward when you put your weight down, thus causing the knee to buckle (give out) much easier.
- If the prosthesis leans backward in the new shoes then the heel height is **too low**. This can cause the knee to push backward (or feel like it's hyperextending) when you put your weight on it. It can make it difficult to take a full step and it may feel like

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you are walking up hill.

Problems Arising from Poor Suspension

- If your suspension is poor, you will notice your limb pistoning in the socket. As a result you may develop slow, laborious walking. When you lift your leg, you feel like you have to wait for the prosthesis, or that you have to lift the leg higher than usual to swing it through without catching the toes.

Skin Problems

- The end of the residual limb is reddish/purple and/or moist. You may be lacking contact between the end of your limb and the very end of your prosthetic socket. This creates a vacuum effect on only the bottom of the limb.

Possible causes:

- You may be wearing too many ply of sock and have lifted your limb up and away from the bottom of the socket
 - The end of your limb may have shrunk; leaving a void (empty space) that was not there originally
- **3S-Silicone Suction Suspension Prosthesis**
Rash on residual limb
 - Thoroughly clean the inside of your liner every day with mild soap and water. Rinse out all soap residue. Any soap residue can cause skin irritation.
 - Do not use any lotions or soaps containing deodorants or perfumes on your residual limb.
 - Make sure to *roll* the liner gently up onto your residual limb. Do not *pull* the liner up as this can cause blistering around the top edge of the liner.**Silicone liner slips off residual limb**
 - You may have excessive sweating inside the liner.
 - Your residual limb may have decreased in size and you may need a smaller liner.

Locking pin (plunger) problems

- Pin is sticking, difficult to disengage from shuttle lock
 - A piece of a prosthetic sock may be trapped in the lock with the pin
 - Shuttle lock may be rusty
 - Shuttle lock may be clogged with dirt or residue
- Noise when walking (related to the pin, Noise can occur from other components as well)
 - If you have a ratchet type pin, you may be between "clicks" or ratchets
 - The pin may be worn out and require replacement
 - Shuttle lock may be worn and require replacement

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Prosthetic Knee Problems

Most prosthetic knee problems will require you to make an appointment with your Prosthetist to have the knee adjusted in a manner not to compromise your safety/stability.

1. The knee extends (straightens) too quickly and has a strong impact when totally straight. Feels like a "thud".
2. After your knee flexes (bends), you have to "wait" on the knee to extend (straighten). It feels as though the knee is slow.
3. The knee feels like it is going to buckle when you take a step (see shoe section. If it is not the shoes, call your Prosthetist)
4. Excessive movement or looseness in knee when standing.
5. Hydraulic unit has a whooshing or a gurgling sound during walking
6. The knee is making noise when walking.

WHEN DO I GO TO SEE MY PROSTHETIST?

- If the feeling of discomfort persists, no matter what sock combinations you use.
- If the prosthesis becomes painful; you should call your Prosthetist ASAP.
- If you have tried the suggested solutions above and they have not worked, you need to call your Prosthetist right away to discuss the problems you are encountering and possibly schedule an appointment for an adjustment.

If at any time you have questions or concerns, contact your nearest Westcoast Brace & Limb facility to speak with either a Prosthetist or Prosthetic Case Manager who will help determine if you need to schedule an appointment to be seen in the office.

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