

Using Your Prosthesis

Below Knee Amputation



THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER





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For more health information, go to wexnermedical.osu.edu/patiented or contact the Library for Health Information at 614-293-3707 or health-info@osu.edu.

Preparing for Prosthesis

Becoming less sensitive

To help prepare you for a prosthesis, there are some things that can help make your limb less sensitive to touch and pressure. These include:

- Tapping
- Desensitization
- Limb massage
- Scar massage

Some people find these also help lessen phantom pain. Be sure to check with your doctor or therapist before starting these techniques to prevent injury.

Tapping

Tapping should be done for 1 to 2 minutes, 3 to 4 times each day. If you find it helps phantom pain, you can do it more often.

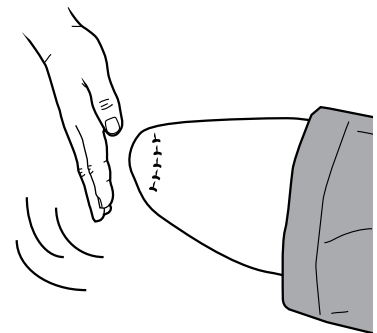
At first, tapping can be done with your compression dressing on or off while the sutures are in place.

- Use the soft, padded parts of your fingers, not your finger nails.
- Gently tap with the pads of your fingers, over the suture line.

After the suture line is healed, you can increase the pressure. You can go from tapping to gently slapping the scar site.

- Use your fingers from 1 or both hands and tap or gently slap the end of your limb.

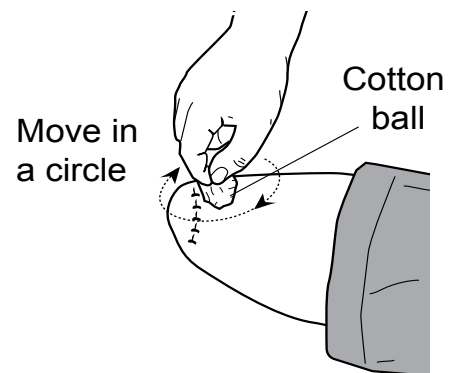
Gently tap



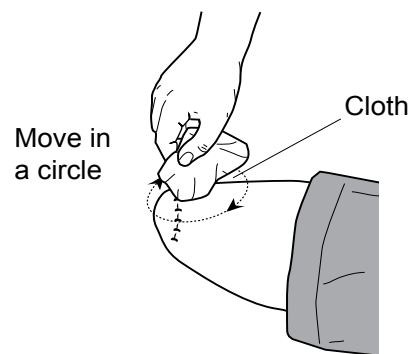
Desensitization

Do this for 2 to 3 minutes, 2 times each day, with your compression dressing off. You will start with soft cotton and move to rougher materials.

- Hold a cotton ball in your hand and gently rub the cotton ball on the skin of your limb.
- Move the cotton ball in circles and rub your entire limb.



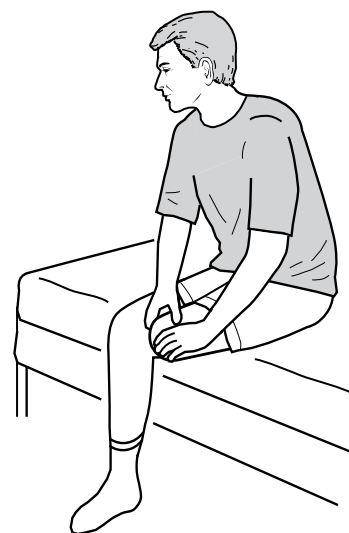
- When you are able, use a rougher material, like a paper towel, instead of the cotton ball.
- As you are able, use a terry cloth towel or washcloth, instead of the paper towel.
- Keep doing this until you are able to tolerate the gentle rubbing of the terry cloth.



Limb massage

Massage for at least 5 minutes, 3 to 4 times each day. You can do it more often if it helps ease phantom pain. You can do massage with your compression dressing off or on.

- Using one or both hands, gently squeeze and release to massage your limb. At first, be cautious around your suture line or scar.
- Start at your suture line and massage up and around your entire limb.
- After your sutures are removed and the site has healed, you can increase the pressure when you squeeze to massage the deeper muscles.



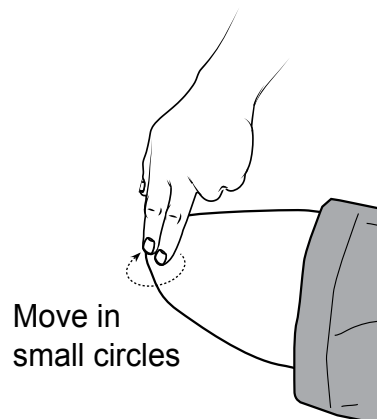
Scar massage

Scar massage is done to keep your scar from getting stiff and tight.

If the scar attaches to the tissue, it can cause more pain and be a site for blisters when you wear the prosthesis. Massaging the area will help keep the scar loose and less thick.

Do this 1 time each day when you bathe.

- Before your suture line heals, you will not be pressing on the scar line. You will move the skin around the bone at the end of your limb. It is best to do this when your compression dressing is off.
 - Place 2 of your fingertips on the skin over the bony end of your limb.
 - Press firmly and move your fingers in circles across the bone.
 - Keep making circles until you have massaged all of the skin around the end of your limb.
- After your suture line has healed, place your fingers on the scar line and move in circles across your scar. Press in gently along the scar to move the skin over the tissue lying underneath.



Prosthetic Sock Changes

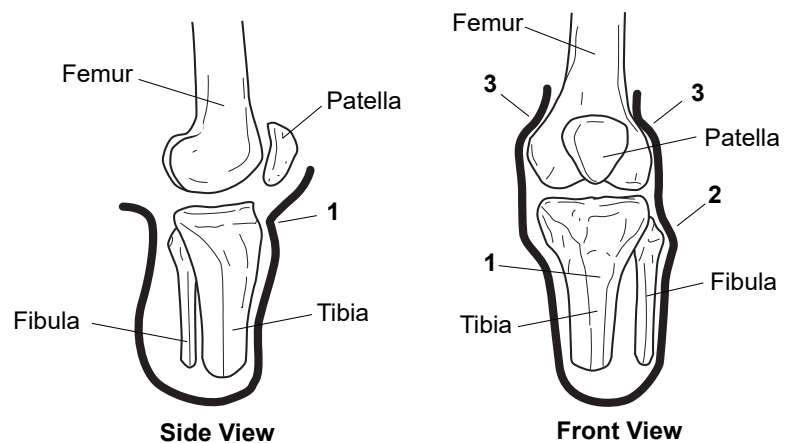
You may need to make changes to the socks you wear on your residual limb to keep a good fit of your prosthesis and to decrease the risk of skin break down. Problems may occur because your leg is not going down into the prosthesis far enough or because too much pressure is placed on the end of your limb if your residual limb goes too deep into the socket.

If your limb is too far out of the socket

Discomfort or too much pressure happens if your leg is swollen, if you have on too many socks, or if the socks are too thick. Pressure sites to check are numbered in the pictures.

These are:

1. Bony bump below your knee cap.
2. Bony bump on the outside of your residual limb below the knee. This is the top end of the fibula bone, also called the fibular head.
3. Bony bumps on the inside and outside of your leg above the knee. These bumps are the end of the upper leg bone called the femur.

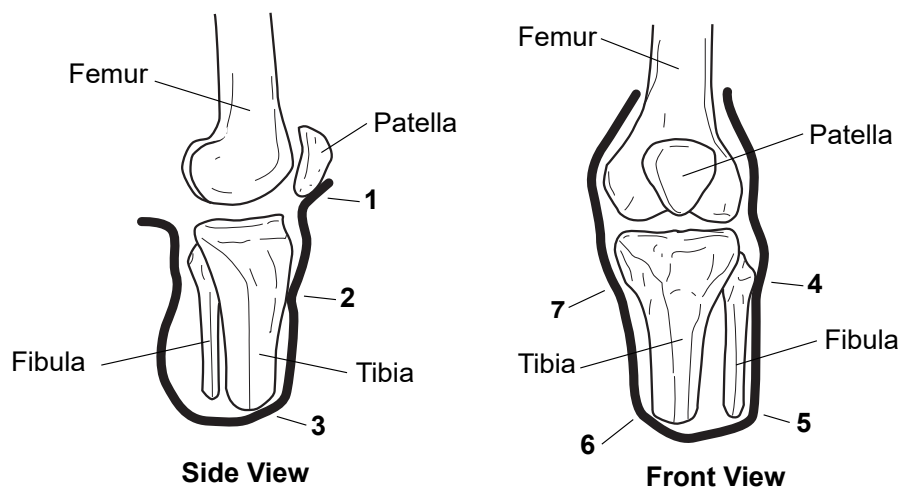


If your limb goes too deep into the socket

Discomfort or too much pressure happens if too few socks are worn or if the socks are too thin. Pressure sites to check are numbered in the picture below.

These are:

1. Bottom of your knee cap.
2. Bony bump below your knee cap at the front of your leg.
3. Bottom front of your residual limb (the larger long bone of your lower leg called the tibia).
4. Bony bump on the outside of your leg below the knee (the head of the fibula, the smaller long bone in your lower leg).
5. Outside end of your limb.
6. Inside end of your residual limb at the tibia.
7. Bony bump of the tibia at the inside of the leg, below the knee.



If you find a red spot, blister, open area, or other skin problem, call your doctor right away.

Balance Exercises With Prosthesis

Instructions

These exercises help you improve your balance and strengthen the muscles to best use your prosthetic leg.

- Do these exercises as directed by your therapist or doctor.
- Do the exercises slowly and with smooth motions to avoid injury to the muscles.
- Be sure to keep breathing while exercising. Do not hold your breath.

Exercise plan

Do only the checked (✓) exercises below. You may use a walker, table or sturdy chair for support, if needed.

Do these exercises ____ times each week.

Repeat each exercise ____ times.

Hold each position for ____ seconds.

Exercises

Standing Balance

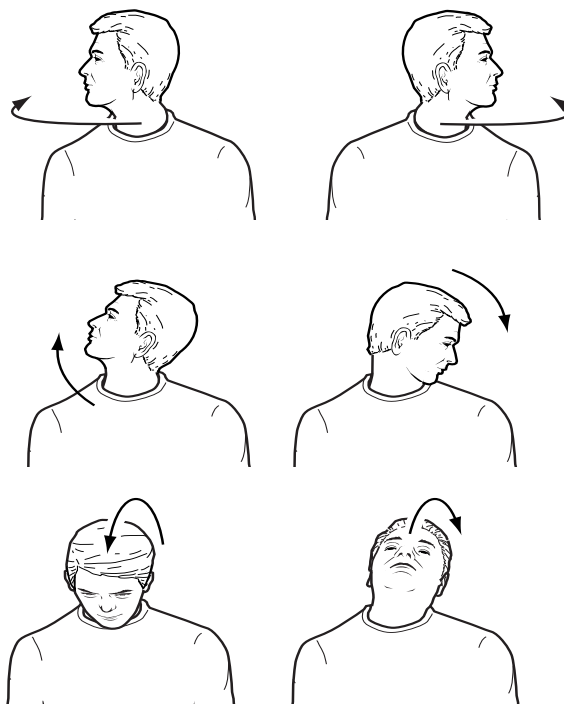
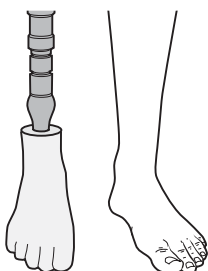
For this exercise, you will change your head and feet positions. Be sure to keep your eyes open during these exercises.

For support, use:

- Your right hand
- Your left hand
- Both hands
- No hands

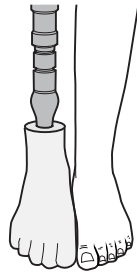
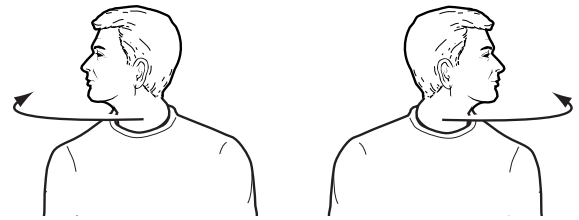
1. With your feet apart:

- Look from side to side.
- Look up to the side and then down to the side.
- Look down and look up.



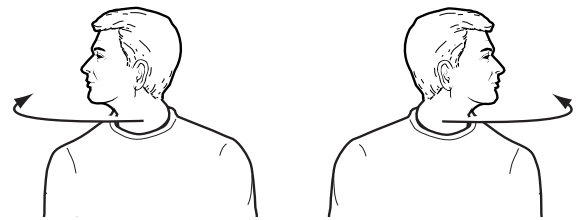
2. With your feet together:

- Look from side to side.
- Look up to the side and then down to the side.
- Look down and look up.



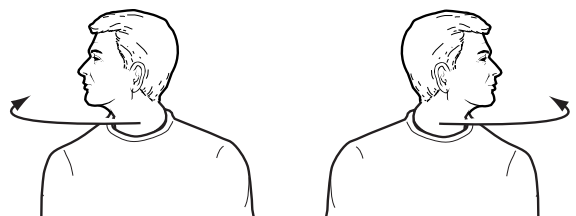
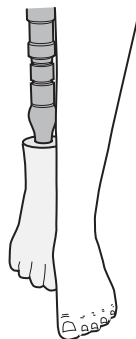
3. With your prosthetic foot in front of your other foot:

- Look from side to side.
- Look up to the side and then down to the side.
- Look down and look up.

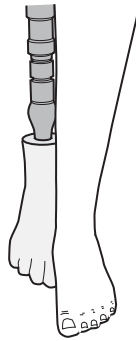


4. Repeat with your prosthetic foot behind your other foot:

- Look from side to side.



- Look up to the side and then down to the side.
- Look down and look up.

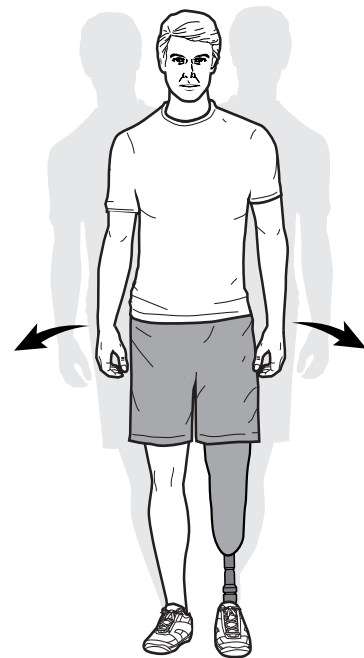


Side to Side Weight Shift

For support, use:

- Your right hand
- Your left hand
- Both hands
- No hands

- Stand up straight with your head up and look straight ahead.
- Slowly shift your weight to your side as far as you can go without moving your feet.
- When you shift onto your prosthetic leg, focus on squeezing your buttocks and tightening or contracting the muscles in the socket. You will feel the pressure change in your socket when you shift your weight.
- Return to the center. Then shift your weight back to your other side as far as you can.



Leg Circle Roll

For support, use:

- Your right hand
- Your left hand
- Both hands
- No hands

- Stand up straight and place your foot on a tennis ball with your knee slightly bent.
- Keeping your balance on your prosthetic leg, roll the tennis ball with your foot back and forth, side to side and in circles.
- As your balance improves, use a soccer ball or basketball under your foot.

Repeat _____ times in each direction.

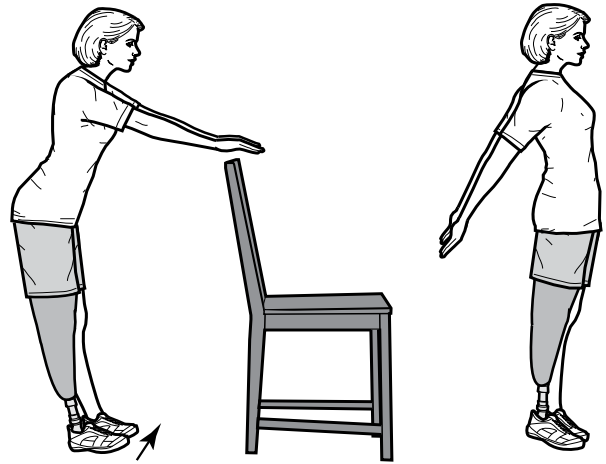


Weight Shift Front to Back

For support, use:

- Your right hand
- Your left hand
- Both hands
- No hands

- Stand and slowly shift your weight forward by moving your hips forward over your toes until your heels come off the floor slightly.
- Then return to your starting position. Keep your hands close to a chair to use for support as needed.
- Shift your weight onto your heels and press your thigh or upper leg back in the socket until your toes come off the floor slightly.
- Keep your hands close to the chair to use for support as needed.

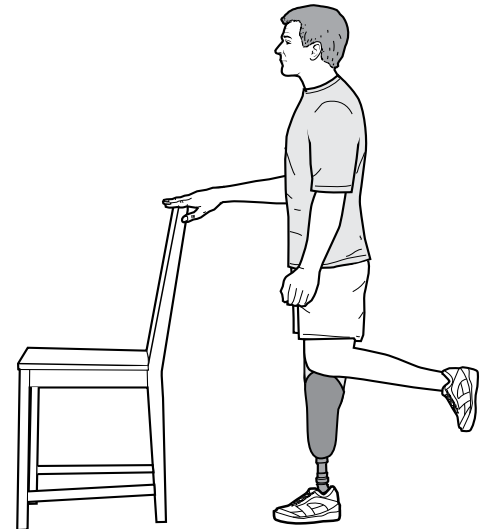


Single Leg Balance

For support, use:

- Your right hand
- Your left hand
- Both hands
- No hands

- Stand behind a sturdy chair or by a counter or table that you can use for support if needed.
- Lift your unaffected leg and stand on your prosthetic leg, keeping your back straight and your head up and looking forward. Focus on tightening your muscles in your buttocks to keep your hips level.
- Repeat with your unaffected leg.

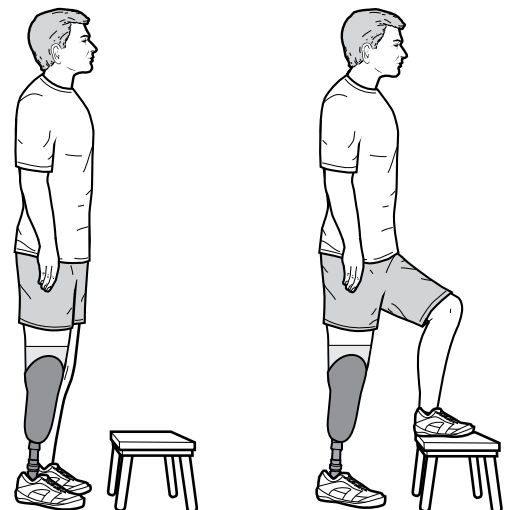


Weight Shift With Stool

For support, use:

- Your right hand
- Your left hand
- Both hands
- No hands

- Stand near a stool or step and shift your weight onto your prosthetic leg, tightening the hip muscles on that side.
- Slowly raise your sound foot up on the stool. Relax the muscles of your residual limb.
- Tighten your muscles in your residual limb again and slowly bring your foot back down off the stool. Try to keep the rest of your body still and relaxed.



Stretching With Prosthesis

Instructions

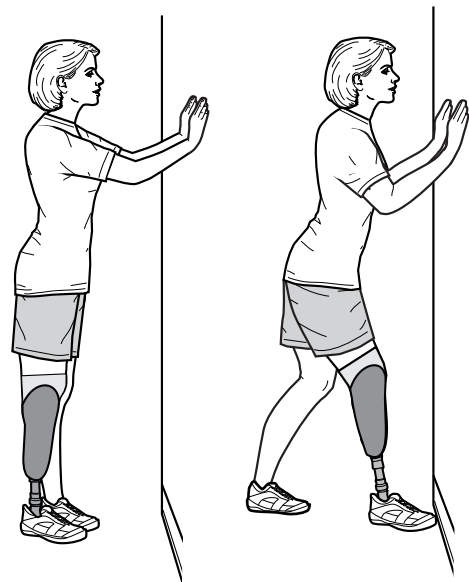
Stretching exercises will help keep your hip and leg muscles in good condition and better able to use your prosthesis.

- Only do the stretches checked by your therapist.
- Do each marked stretch ____ times each (repetitions) ____ times per day.
- Do the stretches slowly and with smooth motions to avoid injury to the muscles. Do not bounce back and forth.
- Hold each stretch for about 30 seconds and then release.
- Be sure to keep breathing while stretching. Do not hold your breath.

Stretches

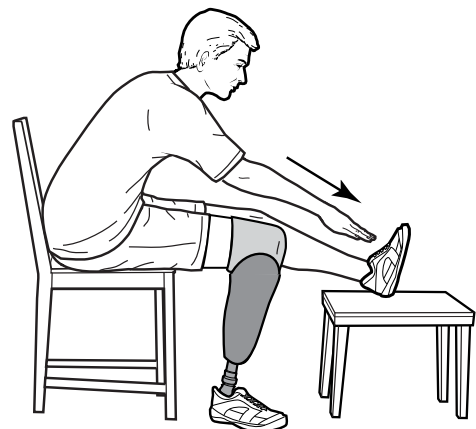
❑ Wall Lean (Soleus and Gastroc Stretch)

- With prosthesis on, stand an arm's length from the wall and put your hands on the wall.
- Step your prosthetic foot forward and bend your knee on your unaffected leg, leaning into the wall.
- Keep your heel on the ground. You should feel the stretch in your lower leg.
- Repeat this stretch with the knee of your unaffected leg straight.



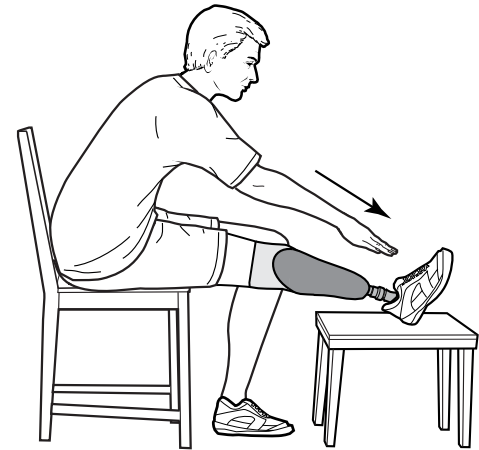
❑ Hamstring Stretch With Stool

- With your prosthesis on, sit on a firm chair.
- Place the foot of your unaffected leg up on a foot stool or low table so your leg is out in front of you.
- Lean forward and reach your hand down towards your foot on the stool to feel the stretch in the back of your upper leg or thigh.



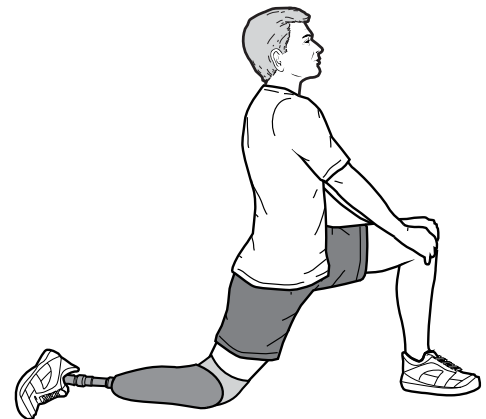
❑ **Repeat with your prosthetic leg up.**

- Place the foot of your prosthetic leg up on a foot stool or low table so your leg is out in front of you.
- Lean forward and reach your hand down toward your foot on the stool to feel the stretch in the back of your upper leg or thigh.



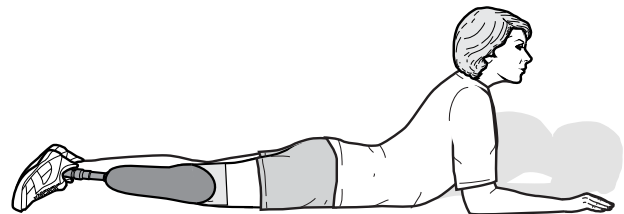
❑ **Hip Flexor Stretch With Prosthesis**

- Step forward with unaffected leg and kneel down on your prosthetic knee.
- With your hands on the knee of your unaffected leg, move your knee forward and feel the stretch.
- Repeat on the other side with your prosthetic knee forward.



❑ **Elbow Raise (Prone Prop)**

- Lie face down with your arms against your body with your hands by your head. Your legs should be straight out behind you.
- Keep your hips on the floor and your lower back and buttocks relaxed and lift up onto your elbows, lifting your chest up. You should feel a stretch at the front of your hip.
- Work up to holding this position for 2 minutes.

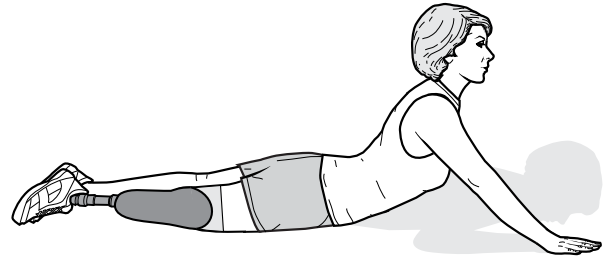


Place a towel roll under your upper leg to increase the stretch.

❑ Prone Press Up

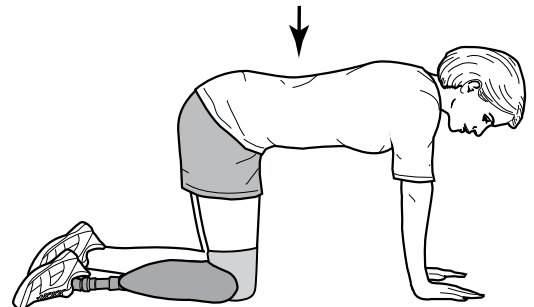
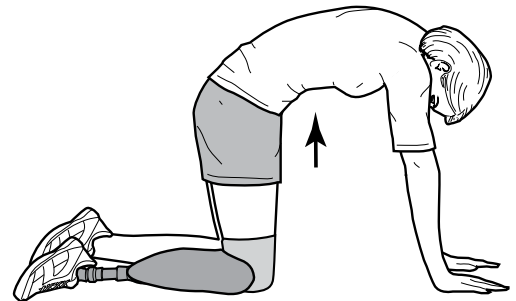
- Lie face down with your hands by your shoulders, your legs straight out behind you.
- Raise your chest off the floor by rising up on your hands until your elbows are straight.
- Keep your hips on the floor and your buttocks and lower back relaxed. You should feel a stretch at the front of your hip.

Place a towel roll under your upper leg to increase the stretch.



❑ Cat and Camel Stretch

- Get on your hands and knees and hold your head up looking to the front, like a cat.
- Tuck your chin and tighten your stomach muscles as you arch your back up.
- Slowly raise your head back up and let your back sway down toward the floor.



Exercises Wearing Prosthesis

These exercises help you improve your balance and strengthen the muscles to best use your prosthetic leg.

- Do these exercises as directed by your therapist or doctor.
- Do the exercises slowly and with smooth motions to avoid injury to the muscles.
- Be sure to keep breathing while exercising. Do not hold your breath.

Exercise plan

Do only the checked (✓) exercises below.

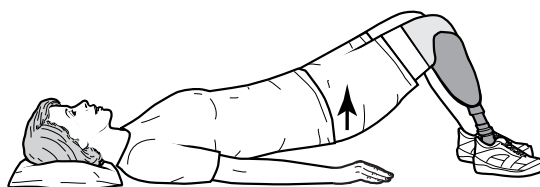
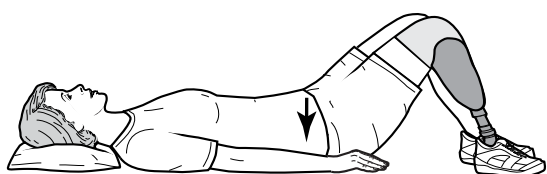
Do these exercises ____ times each day.

Repeat these exercises ____ times.

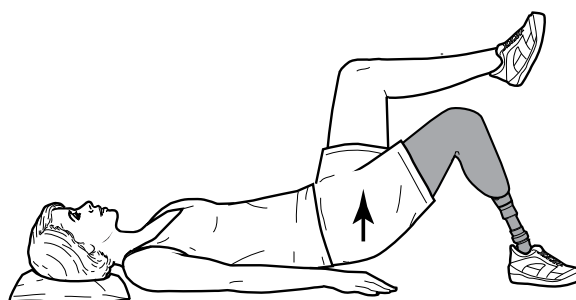
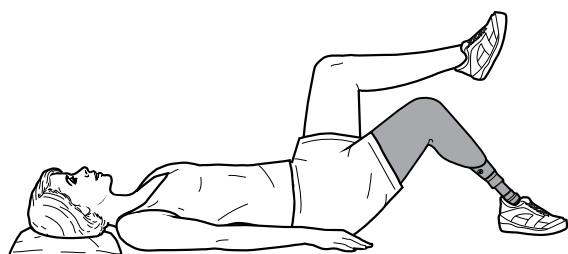
Exercises

Bridging

- Lie on your back on a pad or mat, knees bent and feet flat on the floor. You can use a pillow under your head for comfort.
- Keep your stomach muscles tight and slowly lift your buttocks off the floor.

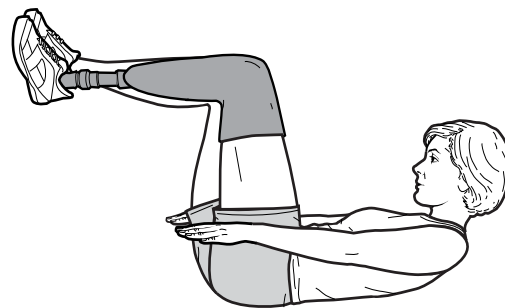


- As you advance, do this exercise while holding your sound leg off the mat so you bridge only with your prosthetic side.



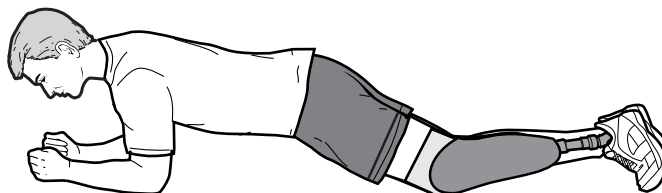
❑ Knees Up Abdominal Crunch (Pilates 100s)

- Lie on your back on a pad or mat, knees bent and feet flat on the floor. Arms at your sides.
- Lift your feet, head and hands off the floor while you tighten your stomach muscles and flatten your lower back to the floor.
- Pump your arms up and down slightly _____ times.
- Slowly return to the start position, relax and then repeat.



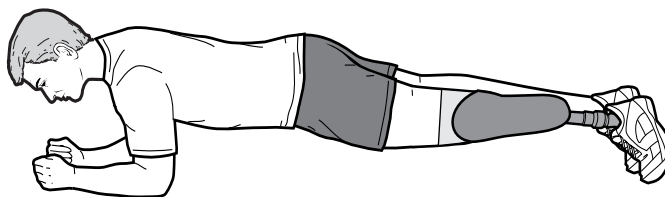
❑ Forward Plank – Elbows and Knees

- Lie face down on a mat or the floor.
- With your elbows bent and at shoulder width, lift your body up on your elbows and knees.
- Keep your elbows under your shoulders and tighten your stomach muscles to keep your body in this position.



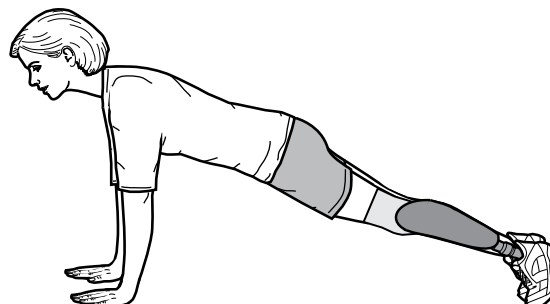
❑ Forward Plank – Elbows and Toes

- Lie face down on a mat or the floor.
- With your elbows bent and at shoulder width, lift your body up on your elbows and toes. Press leg back into socket to keep prosthetic knee straight.
- Keep your elbows under your shoulders and tighten your stomach muscles to keep your body straight from head to toe.



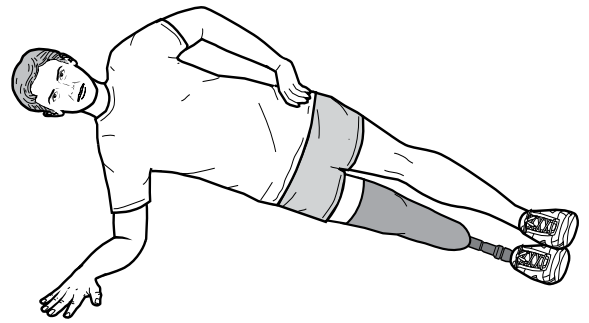
❑ Forward Plank – Hands and Toes

- Lie face down on a mat or the floor.
- With your elbows bent and at shoulder width, lift your body up on your hands and toes, pressing leg back into socket to keep prosthetic knee straight.
- Lift your body up so your weight is supported on your hands and feet.
- Keep your elbows under your shoulders and tighten your stomach muscles to keep your body straight and off the floor.



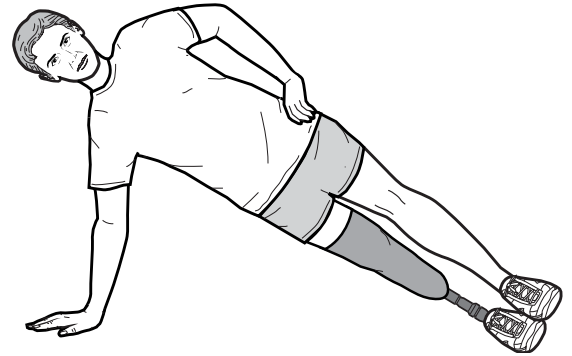
❑ Side Plank – Bent Arm

- Lie on your prosthetic side on a mat or the floor.
- Lift your body up so your weight is supported on your hand and foot.
- Keep your hand and elbow under your shoulder and tighten your stomach muscles to keep your body straight and off the floor.
- Hold for ____ seconds.



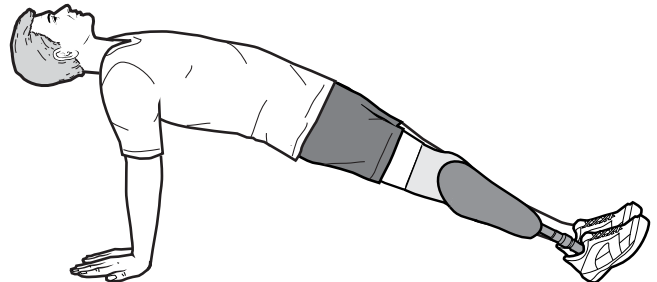
❑ Side Plank – Straight Arm

- Lie on your prosthetic side on a mat or the floor.
- Lift your body up so your weight is supported on your hand and foot.
- Keep your hand and elbow under your shoulder and tighten your stomach muscles to keep your body straight and off the floor.
- Hold for ____ seconds.



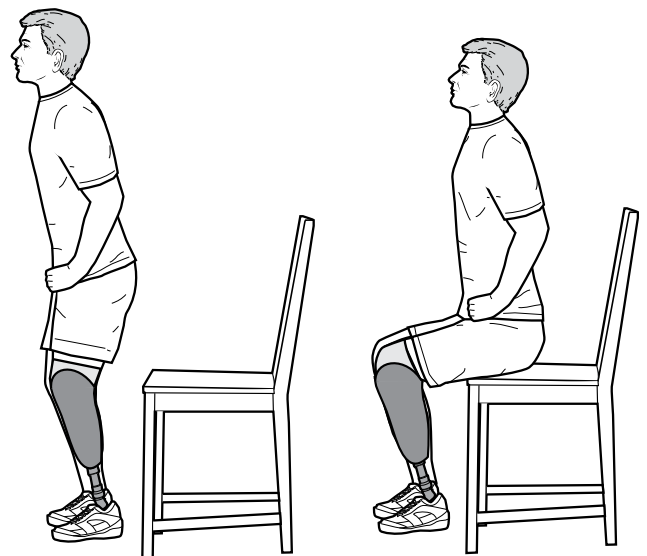
❑ Reverse Plank

- Sit on a mat or the floor with your legs out straight. Your palms should be under your shoulders.
- Lift your body off the floor so only your hands and feet touch the floor.
- Keep your body straight and tighten the muscles of your buttocks and upper legs.



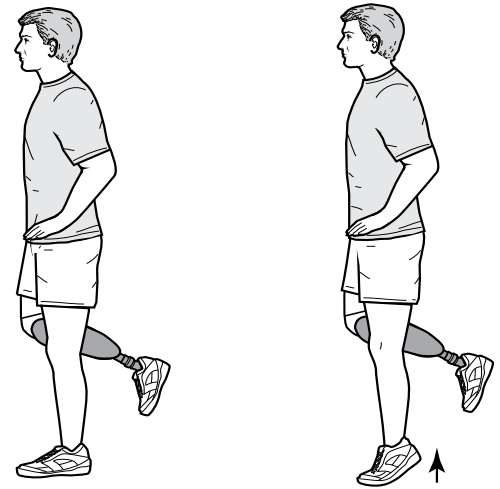
❑ Sit to Stand

- Sit on the edge of a firm chair with your feet underneath you and flat on the floor. Cross your hands across your chest or place them on your hips.
- Lead with your head and stand up, pressing back in the socket to help straighten your prosthetic knee. Try to keep the same amount of weight on each leg.
- Lower yourself back down to the sitting position and then repeat.



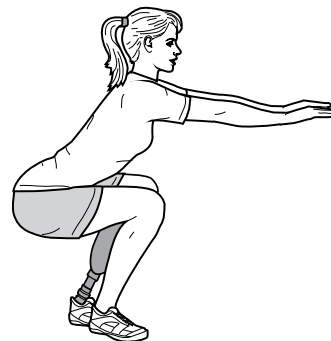
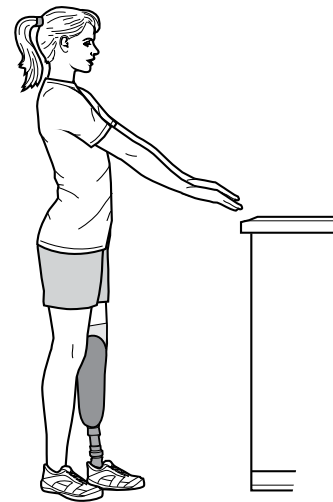
❑ Heel Raises

- Stand near a sturdy chair, table or counter so you can use it for balance if needed.
- Balance on your unaffected leg.
- Raise your heel and balance on the ball of your foot, then slowly put your heel back down.



❑ Standing Squat

- Stand with your hands supporting you at a counter or table and turn your prosthesis out to the side slightly.
- Bend your knees to squat and slowly lower yourself to a count of 4. Be sure to keep your heels on the floor.
- Hold for 2 seconds and then slowly straighten your knees to a count of 4.



Theraband Exercises With Prosthesis

These exercises will help strengthen your legs. It is best to do any exercise slowly and with smooth motions. Be sure to breathe in through your nose and out through your mouth while exercising. You should never hold your breath while exercising because it may cause your blood pressure to rise.

For each exercise

- Support yourself with a table or back of a chair, unless indicated otherwise by your therapist.
- Loop one end of the exercise band around a chair or table leg, or by securing a knotted end through a door.
- Your therapist will indicate which side(s) to place into the band and how much tension to apply.
- Exercise tubing can be used in place of an exercise band.

Exercises

Do only those exercises checked by your therapist.

Do these exercises _____ times per _____.

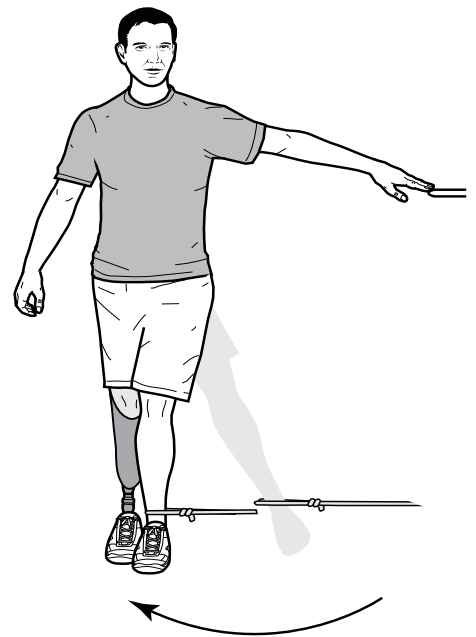
Repeat each exercise _____ times.

To help maintain your balance, hold onto a supporting object with:

- Your right hand
- Your left hand
- Both hands

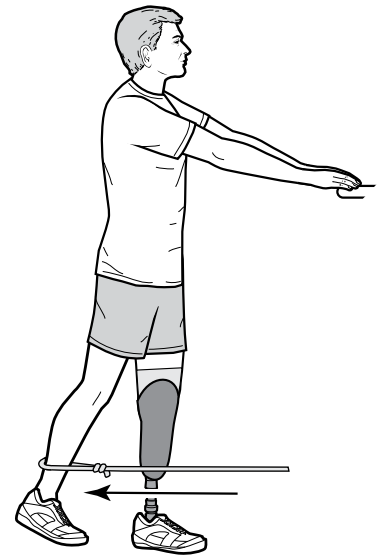
Pull to the Middle (Hip Adduction)

- Stand so that your leg attached to the band is closest to where the band is anchored. You will be facing perpendicular to the line of the band.
- Support your weight on leg not attached to band and bring your other leg forward to the midline of your body.
- Slowly return to the starting position.



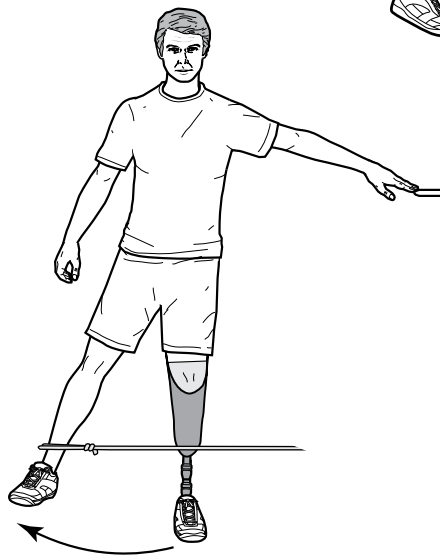
❑ Pull to the Back (Hip Extension)

- Stand facing the anchor of the band.
- Support your weight on leg not attached to band and bring your other leg backward from your body, stretching the band in front of you.
- Slowly return to the starting position.



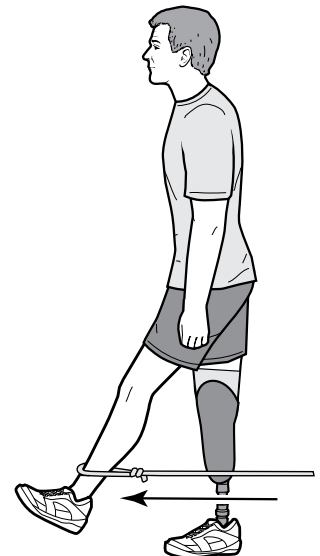
❑ Pull to the Side (Hip Abduction)

- Stand so that your leg not attached to the band is closest to where the band is anchored. You will be facing perpendicular to the line of the band.
- Support your weight on leg not attached to band and bring your other leg out to the side from your body.
- Slowly return to the starting position.



❑ Pull to the front (Hip Flexion)

- Stand facing away from the anchor of the band.
- Support your weight on leg not attached to band and bring your other leg forward from your body, stretching the band behind you.
- Slowly return to the starting position.



Prosthetic and Orthotic Companies

Below is a sample list of companies in Columbus and central Ohio that provide prosthetics and special braces, called orthotics. Go to their websites for other locations. There may be other companies in your area. Go to www.abcop.org to find an accredited facility or search for more locations at www.yellowpages.com. Be sure to check with your insurance company to see if they have a certain company you should use.

Ace Prosthetics, Inc.

aceprosthetics.com

4971 Arlington Centre Blvd., Suite A
Columbus, OH 43
614-291-8325

American Orthopedics

amerortho.com

Columbus Office:
1151 W. 5th Ave.
Columbus, OH 43212
614-291-6454

Lima Office:
855 W. Market St., Suite C
Lima, OH 45805
419-909-0404

Marion Office:
Marion Centre Mall
1459 Marion-Waldo Road, #230
Marion, OH 43302
740-375-9100

Boston Orthotics and Prosthetics

bostonoandp.com

566 E. Main St.
Columbus, OH 43215
614-231-4256

Capital Prosthetic & Orthotic Center, Inc.

capitalprosthetics.net

4678 Larwell Drive
Columbus, OH 43220
614-451-0446 or 1-800-215-0764

Hanger Prosthetics & Orthotics, Inc.

hangerclinic.com or 877-442-6437

Locations in Columbus:

1357 Dublin Rd.
Columbus, OH 43215
614-481-8338

1210 Gemini Place, Suite 101
Columbus, OH 43240
614-436-3516

255 Taylor Station Road, Suite 200
Columbus, OH 43123
614-471-8210

515 E. Main St., Suite 100
Columbus, OH 43215
614-992-6440

Next Step Prosthetics

nextstepohio.com

4830 Knightsbridge Blvd., Suite M,
Columbus, OH 43214
614-305-5155

Optimus Prosthetics

optimusprosthetics.com

975 Bethel Road
Columbus, OH 43214
614-263-5462

Prosthetix Shop

prosthetixshop.com

431 Ohio Pike, #124 South
Cincinnati, OH 45255
513-843-5126 or 859-440-3178



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wexnermedical.osu.edu