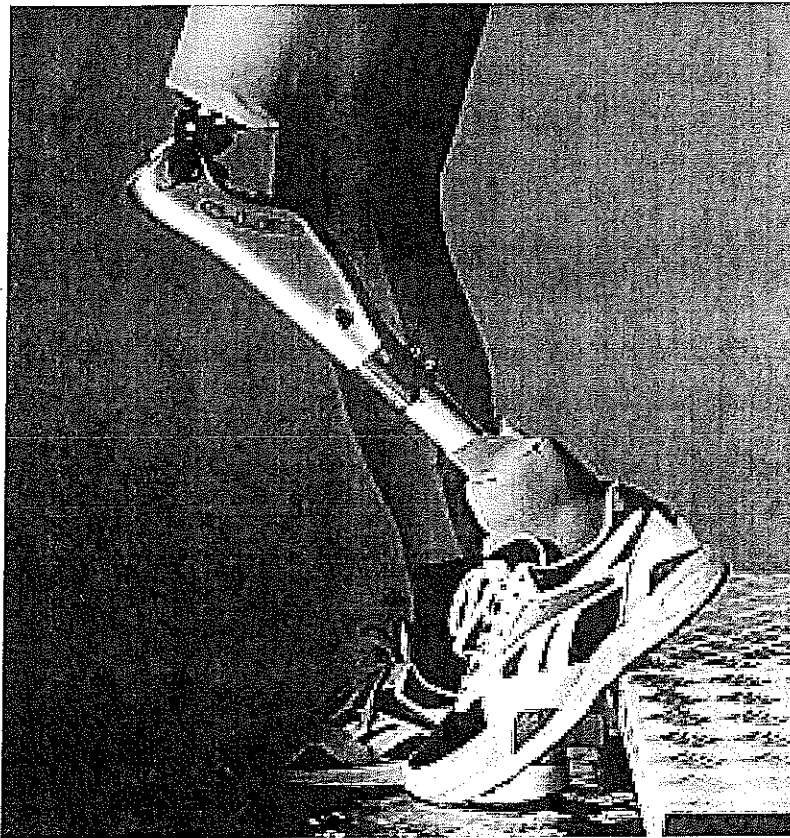
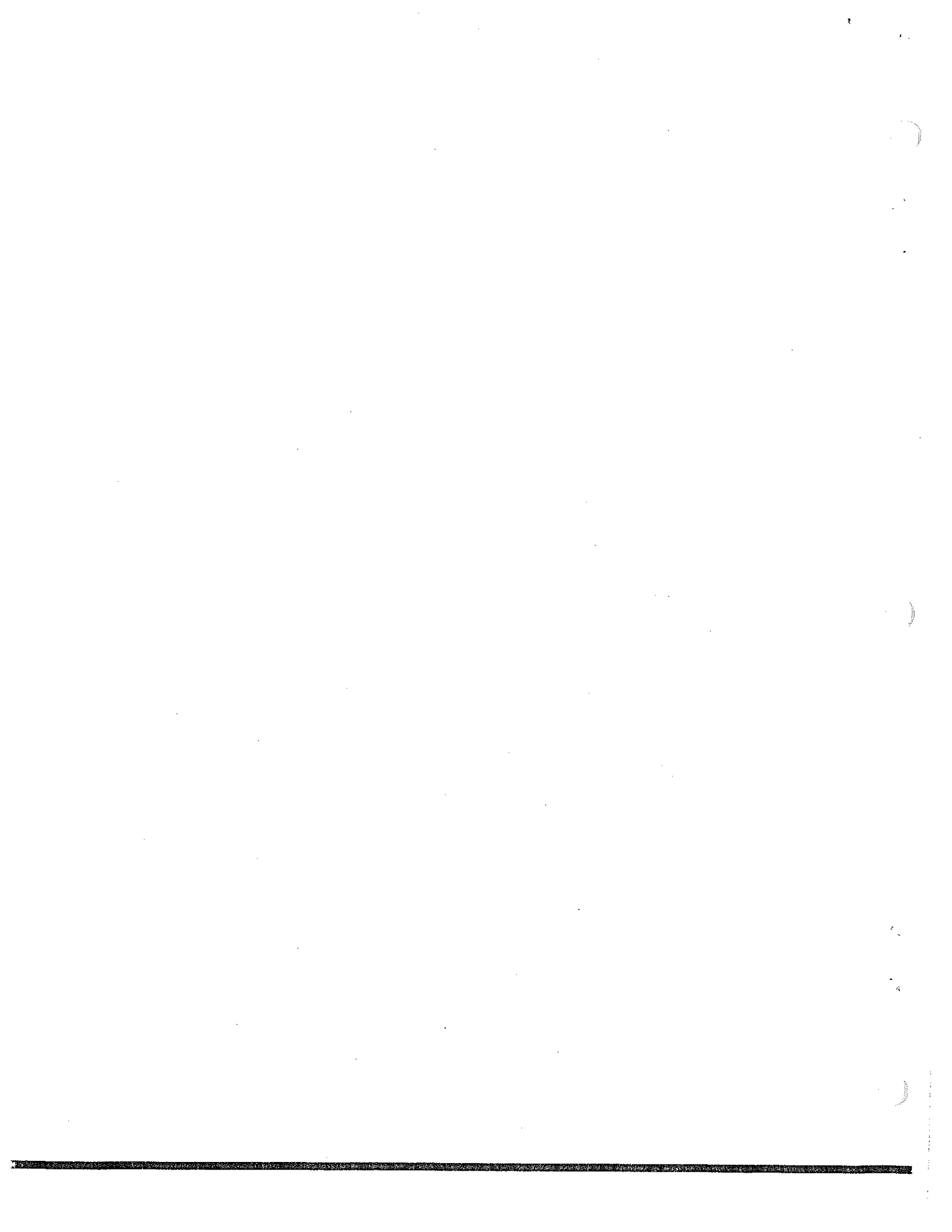


## Below and Above the Knee Amputations





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## **Below and Above the Knee Amputations**

We know that coping with an amputation is hard. This packet provides useful information before and after your surgery. You are not alone and we want to help you through your recovery. Contact your health care team if you have any questions or concerns.

### **Deciding on the Level of Amputation**

The level of amputation you need is based on the condition and blood flow to that involved leg. Your surgeon will decide how much of your leg needs to be removed in order for you to have the best results.

This decision includes:

- Give you the best function of the leg.
- Have a good prosthetic (artificial limb) fitting.
- Conserve as much of the limb length as possible.
- Have good wound healing.

### **What to Expect After Surgery**

During your stay here in the hospital, we will work with you and your family to:

- Control your pain.
- Promote healing of the incision.
- Reduce problems after surgery.
- Teach you how to move in bed, transfer from a bed to a chair, and other activities you will learn to do independently.
- Maintain or regain strength in the affected leg.
- Maintain or improve movement of the joint.
- Help you cope with the loss of your limb.
- Gain initial skill in walking with a walking device, such as a walker, crutches, or prosthesis.
- Help with discharge planning and follow up care.

## **Your healthcare team**

There will be many health professionals working together to provide the best care possible.

- Your doctor will coordinate your medical care. This includes the history, physical exam, and diagnosis of your present medical problems, discussion of your surgery and treatment plan, and the ordering of your medications, blood tests, therapy, and other care. Other doctors may be consulted to help in your care.
- Your nurses will give you medications, monitor your progress, provide care, teach you about your care after discharge, offer support, and help communicate to all of the team members.
- Physical and occupational therapists will teach you strengthening and flexibility exercises, bed mobility, transfer training, walking, and self-care activities. They will also help you use adaptive equipment to maximize your independence to return to your lifestyle.
- A social worker will help you and your family identify items you will need at home, community resources, and strategies to cope with the loss of a limb. The social worker can help answer financial questions about your care and connect you with services that can help you.
- A case manager helps make sure you are getting the appropriate care while you are in the hospital.
- A prosthetist (an artificial limb-maker) will help you in the design and make of your artificial limb.

## **Leg Pain and Sensations**

Most people feel some sensations such as pain, itching or tingling in the missing part of their leg. This is called phantom pain and phantom leg sensations. We do not know why these feelings occur, but they are real and common. Over time, these feelings go away, but for some they continue throughout life.

- Phantom leg sensation is a normal event where you feel the limb that is no longer there. This is often described as a tingling, cramping, squeezing, feeling of pressure sensation, or numbness. If you have any of these feelings, you can still use an artificial limb.
- Phantom pain occurs less often and is described as shooting or burning pain. This sensation may limit your ability to use an artificial limb.

## **Emotional Adjustment**

The loss of a leg is an emotional time. At the beginning, you may have feelings of grief, hopelessness, bitterness, and anger. These feelings are normal. You may have concerns about the future, your body image, how you will function, and the response of others. Give yourself time to work through these emotions, and learn how to walk and use your limb again. This is a big change, and it takes time to get used to the way your body looks and feels. Your personality, your sense of accomplishment and your place in your family, community, and the world are all important to coping successfully.

## **Emotional Support**

We know that recovering from an amputation is hard. It is important to be around people that are reassuring, understanding, open, and willing to listen to you. You are not alone; talk to your health care team, your friends, and family. There are groups that can give you support and information from others in similar situations.

## **Community Resources**

- Your doctor will refer you to the appropriate prosthetic company.
- SEAL (Support and Education for Amputees & Loved Ones) is a non-profit organization in Columbus, Ohio that advocates for the rights of people with limb loss and provides support, education, and resources to enable people with limb loss and their loved ones to lead empowered lives. Visit [www.sealohio.com](http://www.sealohio.com) or call (614) 582-3438 for more information.
- Support/Peer Group - This peer group provides a forum for people with an amputation and family members to share and compare experiences, challenges, and triumphs in a positive and uplifting setting. You will learn more about important topics like prosthetics, financial assistance, and everyday challenges. The group meets on the 3rd Wednesday of each month from 6:00 to 8:00pm at the Columbus Metropolitan Library, main branch, 96 South Grant Avenue.
- Fore Hope is a nationally recognized, non-profit organization that uses golf as an instrument to improve the quality of life for persons with disabilities, illnesses, injuries, inactive lifestyles, and other life challenges. Contact Fore Hope at (614) 784-1111, or visit [www.forehope.org](http://www.forehope.org).

- The Adaptive Adventure Sports Coalition (TAASC) offers a variety of opportunities to participate in sporting activities. Through sports, people with disabilities gain strength and endurance; reach rehabilitation, competition or leisure goals; and find opportunities for leadership. TAASC uses special equipment and instruction to remove barriers in settings that are fun, safe and provide the opportunity for learning and challenge.

TAASC is located on a 22 acre park in Powell, Ohio where kayaking, water skiing, fishing and cycling are based. Sailing is at Alum creek Sailing Club. TAASC works with area ski resorts, the Ohio Valley Rowing Club and Chiller ice rink for other sports.

6000 Harriot Rd, Powell, Ohio.

614-389-3921

[www.taasc.org](http://www.taasc.org).

### **After surgery**

During your stay in the hospital, we will work with you and your family to achieve the following goals:

#### **1. Control your pain**

Important points:

- Post operative pain and discomfort after your operation usually lasts 4 to 6 weeks.
- YOU are the expert on your pain.
- Tell us when you hurt or are uncomfortable.
- Ask for your pain medicine when you need it throughout the day and at night.
- The longer you wait to take any pain medicine, the worse your pain will become and the longer it may take to control it.
- Tell us if your pain medicine is not working or if you do not like the way it makes you feel.
- You cannot leave the hospital with an I.V. pain medication pump.

- We will ask you to rate your pain on a scale from 0 to 10, with 10 being the most severe pain and 0 being no pain at all

|-----|-----|

0

5

10

No pain

Moderate pain

Worst pain

- Your doctor will order pain medicine (I.V., shot, pills) to best meet your needs.
- You will receive pain medication based on the rating of your pain.
- If your pain medicine does not seem to be working, call your nurse.
- If you get sleepy, just relax. The pain medicine has that effect on people.

Remember: The goal of pain control is to make you as comfortable as possible to allow you to get out of bed and to do your daily activities. Your pain will be reduced but may not be totally be relieved.

## 2. Promote healing of the incision

Depending on the reason for your amputation and the state of your limb at the time of injury, definitive wound closure may take place immediately or be delayed until a later date. Wound care involves two options. Here we will review the two options of the recovery process:

### A. Option 1: Pre-closure of the Residual Limb

This option promotes healing of the underlying soft tissue and reduces the risk of infections. In some instances, a drainage tube is inserted to remove the fluids and to aid in tissue repair. A member of your surgical team will do the dressing changes.

- Notify your nurse if your dressing becomes soiled or if you notice any leaking of drainage.
- Make sure everyone, including yourself, who comes in contact with your wound washes their hands and wears gloves before and after the dressing change.
- Use caution when moving in bed or getting in or out of bed to avoid dislodging any dressing or tubes.

## B. Option 2: Definitive Closure of the Residual Limb

During this phase, the goal is to prepare your wound for the use of a prosthesis. At first, you will have sutures in place to close your surgical wound. These are usually removed in about 14 to 21 days. Your sutures will be covered with petroleum-coated gauze, and initially, a bulky gauze dressing will be applied to provide additional protection. After your sutures are removed, adhesive strips are applied as the final stage of wound healing occurs. These strips will fall off naturally in about 5 to 7 days. Throughout this phase in your wound-healing process, a compression dressing will also be applied to reduce swelling and to begin shaping your residual limb for prosthetic fitting.

There are 2 types of compression dressing:

- Rigid compression dressings: these are made from casting material and will be changed as the swelling in your residual limb decreases.
- Soft compressions: these are elastic bandages applied in a specific way to reduce the swelling at the lower portion of your residual limb. These bandages will need to be reapplied several times during the day to maintain proper compression.

### 3. Reduce problems after surgery.

- Antibiotics may be given after your surgery.
- The nurses will check your incision several times a day.
- All staff and visitors should clean their hands with soap and water or an alcohol-based rub before and after caring for you or visiting you. If you do not see them clean their hands, please ask them to clean their hands.
- The nurses will teach you how to care for your incision. Always clean your hands before and after caring for your incision.
- Eat a good diet.
- Watch for and call the doctor if you see any of the following signs of infection:
  - redness
  - swelling
  - warmth
  - foul smelling odor, or drainage from the incision area
  - fever of 101 degrees or more

## Follow Up Care and Recovery

It will take time for you to learn to use a walker and a wheelchair. You may be getting a prosthesis, which is an artificial leg to replace your limb that was removed. It will take time for your prosthesis to be made. Once you are fitted with your artificial leg, getting used to it will also take time. Our therapists and prosthetists are ready to help you with this transition. After an amputation, it may be difficult for you to care for yourself, especially if you live alone, or if your loved ones are not able to take care of you. Therefore, as part of your recovery, you may have to consider a few follow-up options:

- **Skilled Nursing Facility**

We might recommend that you go to a skilled rehabilitation facility for part of your recovery. These facilities provide nursing and rehabilitation care under a doctor's supervision. Your prosthetist will be able to work with you during your stay there. Your social worker will help you and your family in selecting a facility and checking your health insurance to make sure you have coverage.
- **Long Term Acute Care Hospital**

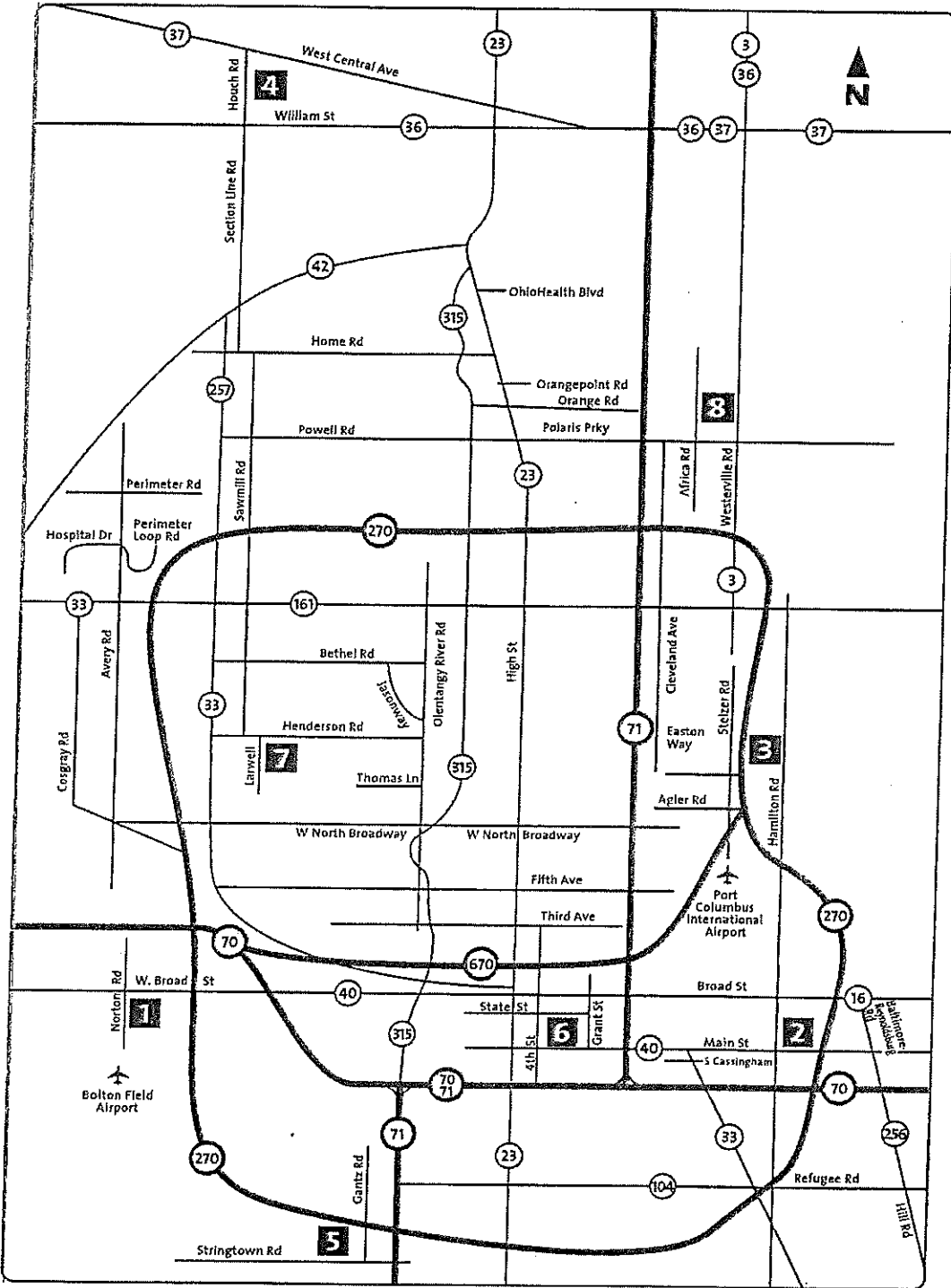
If you are too ill to be in a skilled nursing facility due more than one serious medical condition, but not sick enough to be in a hospital, we may recommend you go to a long-term acute-care hospital. The average length of stay in this facility is typically 25 to 30 days. These facilities offer comprehensive rehabilitation, respiratory therapy, medical and nursing care all under a doctor's supervision.
- **Acute Inpatient Rehabilitation Hospital**

If you are medically stable and require intensive multidisciplinary rehabilitation, we may recommend that you to an acute inpatient rehabilitation hospital. Patients admitted to this type of hospital must be able to tolerate three hours of intense rehabilitation services per day. Nursing and respiratory care are also provided with all of these services being supervised by an attending physician.
- **Outpatient Care**

As you progress, outpatient services may benefit you to help you get back to your normal activities. Your doctor, your social worker, or prosthetist can help you navigate this transition. OhioHealth has outpatient therapy sites that may be convenient for you. Please see the map on the next page for locations. To schedule these services please call 614-566-1111.

- **Home Health Care**

If you have assistance at home but still find that leaving your house is challenging, you may qualify for home health services. A home health nurse, physical therapist, occupational therapist, and aide can be sent to your home to provide necessary care. Your home care coordinator and your social worker will be able to discuss this in detail with you. HomeReach Home Health is OhioHealth's home care company. The number for scheduling or questions is 614-566-0888.



1. **OhioHealth Doctors Hospital**  
5193 West Broad Street, Suite 100  
Columbus, OH 43228  
Phone.....(614) 544-1951  
Fax .....(614) 5441965
2. **OhioHealth Eastside Health Center**  
4850 East Main Street  
Columbus, OH 43213  
Phone.....(614) 566-0929  
Fax.....(614) 566-0957
3. **OhioHealth Gahanna Health Center**  
765 North Hamilton Road  
Gahanna, OH 43230  
Phone.....(614) 566-0507  
Fax.....(614) 566-0515
4. **OhioHealth Grady Memorial Hospital**  
561 West Central Avenue  
Delaware, OH 43015  
Phone.....(740) 615-2660  
Fax.....(740) 615-2663
5. **OhioHealth Grove City Health Center**  
2030 Stringtown Road  
Grove City, OH 43123  
Phone.....(614) 544-0015  
Fax.....(614) 544-0016
6. **OhioHealth Rehabilitation-Downtown**  
223 East Town Street  
Columbus, OH 43215  
Phone.....(614) 566-8555  
Fax.....(614) 566-8701
7. **OhioHealth Rehabilitation-Upper Arlington**  
4664 Larwell Drive  
Columbus, OH 43220  
Phone.....(614) 566-1120  
Fax.....(614) 566-1130
8. **OhioHealth Westerville Medical Campus**  
300 Polaris Parkway  
Westerville, OH 43082  
Phone.....(614) 533-3200  
Fax.....(614) 533-3240

## Things to Do While at Home

### Self care

- Family and friends can help. Talking with them about feelings may make you feel better. They can help you do things around your house and when you go out.
- If you feel sad or depressed, ask your doctor about seeing a mental health counselor for help with your feelings about your amputation.
- If you have diabetes, keep your blood sugar under good control.
- If you have poor blood flow, follow your doctor's instructions for diet and medicines. Your doctor may give you medicines for your pain.
- You may eat your normal foods when you get home.

### Activity

- Do things that will help you get stronger and do your daily activities, such as bathing and cooking. You should try to do as much as possible on your own.
- When you are sitting, keep your limb straight and level supported by a padded board. Try to keep it up to avoid swelling.
- Try not to turn your limb in or out when you are lying in bed or sitting in a chair. You can use rolled up towels or blankets next to your legs to keep them in line with your body.
- Do not cross your legs when you are sitting. It can stop the blood flow to your limb.

### Healthy Diet

- A healthy diet needs to have a balance of fats, proteins, and carbohydrates.
- Eat from all the food groups to meet your calorie, protein, vitamin and mineral needs. Make sure to include vegetables, fruits, whole grains, will help support the healing process after surgery.
- Examples of protein include: meat, eggs, cheese, milk, yogurt, and beans.
- If you are diabetic, try to keep your blood glucose between 80 and 180 mg/dl.

### Wound and Limb Care

- Keep your wound clean and dry unless your doctor and nurse tell you it is okay to get it wet. Clean the area around the wound gently with soap and water. Do not soak it. Dry it well. Do not rub the incision but allow water to flow gently over it.
- Do not take a bath or swim. Your discharge instructions from the hospital will have more information about this.

- Inspect your limb every day. Use a mirror if it is hard for you to see all around it. Look for any redness or drainage.
- Wear your elastic bandage all the time. Make sure there are not creases in it and wear your limb protector whenever you are out of bed.

### Quit Smoking

- Your health is important! Smoking can cause many health problems such as heart disease, breathing problems, strokes and cancer.
- You will decrease your risk of lung and other types of cancers, heart disease, stroke and other lung diseases.
- Former smokers have fewer days of illness, health complaints, bronchitis and pneumonia than smokers do.
- You will save money. A pack-a-day smoker, paying at least \$6 per pack will save more than \$2,190 per year by quitting.

### When to Call the Doctor

Call the doctor if:

- Your limb looks redder or there are red streaks in your skin going up your leg.
- Your skin feels warmer to touch than normal.
- There is swelling or bulging around the wound.
- There is new drainage or bleeding from the wound.
- There are new openings in the wound and the skin around the wound is pulling away.
- Your temperature is above 101.5 F more than once.
- Your skin around the limb or wound is dark or is turning black.
- Your pain is worse and not controlled by pain medicine.
- Your wound has gotten larger.
- A foul smell is coming from the wound.

If your physician plans for you to be fitted with an artificial limb, we will give you information about a prosthetic company to follow up with as your leg heals.

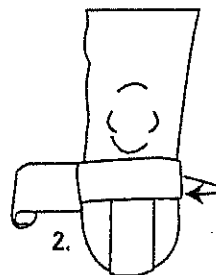
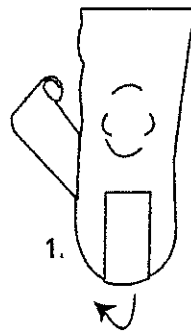
The next section of this booklet will help you care for your amputation and strengthen your muscles.

# Wrapping with an Elastic Bandage

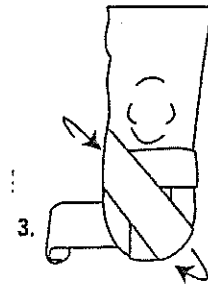
In this stage of your of your healing process, compression dressings will be applied to reduce swelling and begin shaping your residual limb for prosthetic fitting. There are two types of compression dressings; rigid and soft. Rigid dressings are made from cast material and need to be changed as the swelling in your residual limb decreases. Soft dressings are elastic bandages used to reduce the swelling at the lower portion of your residual limb. Re-apply these bandages several times during the day to keep proper compression.

Below the knee amputation:

1. Using a 4-inch wide elastic bandage, go over the end of the limb, slightly stretching the bandage.
2. Relax the stretch and secure the bandage by going around the limb one time.

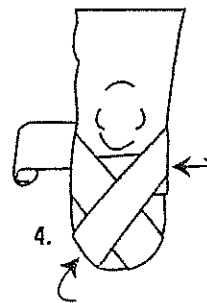


3. Increase the stretch and go to one side of the center.

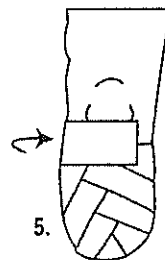


4. Decreasing the stretch, go around the back.

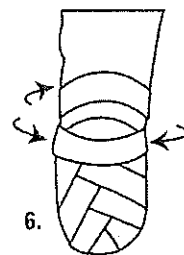
Go up the other side of the center as you increase the stretch again.



5. Repeat this figure-eight pattern until the end is securely bandaged and then secure the bandage with Velcro or tape. Do not use pins to secure the bandage.

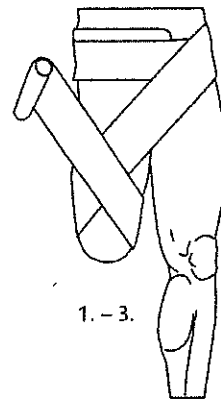


6. If the length below the knee is very short, you will need to make a similar figure-eight pattern above and below the joint and then secure the bandage.

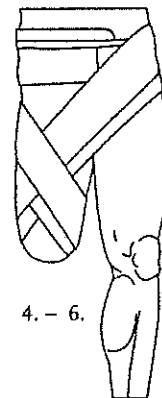


### Above the knee amputation:

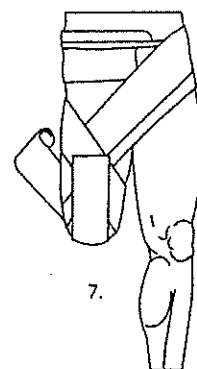
1. Use two 6-inch wide elastic bandages. You can sew them together.
2. Wrap the bandage around the waist twice.
3. Wrap around the end of the limb



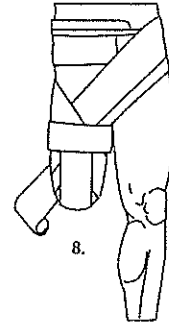
4. Wrap back around the waist
5. Wrap around the end of the limb
6. Wrap around the waist and secure. This is the anchor for the next bandage.



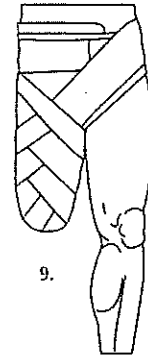
7. Take another 6-inch wide elastic bandage and go over the end of the limb, slightly stretching the bandage



8. Relax the stretch and secure the bandage by going around the limb once.
  - Increase the stretch and go to one side of the center



9. Decreasing the stretch, go around back, and then go up the other side of the center as you increase the stretch again.
  - Repeat this figure-eight pattern until the end is securely bandaged, making sure to bandage all the way up to the groin area. Secure the bandage with Velcro or tape.
  - Do not use pins.

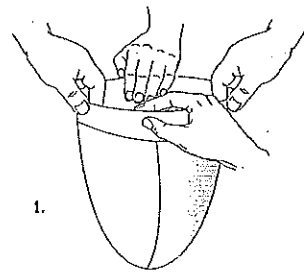


# Wearing an Elastic Shrinker Sock

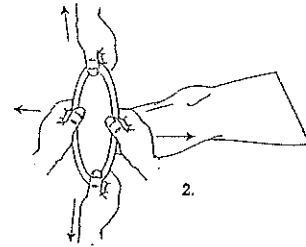
Using an elastic shrinker sock is another way to reduce swelling. You can use a shrinker sock alone or with elastic bandages. If the limb is still very sensitive, it will be more comfortable to stretch the shrinker as you put it on by using two pairs of hands, or an appropriate size ring made of stiff material, such as PVC.

## Using your hands:

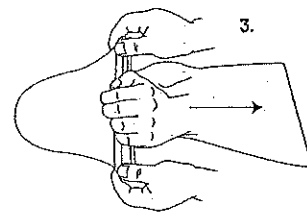
1. With two people using all four of their hands put all of the fingers down to the bottom of the shrinker, thumbs on the outside, spare material scrunched down, and stretch out until the bottom of the shrinker is completely flat and stretched out.



2. Place the flat, inside part of the shrinker against the end of the amputated limb.



3. In one swift motion, keeping the stretch and letting the material slide from between the thumb and fingers, pull the shrinker up the limb.



Remember:

- Do not pull at your stitches even if the skin around them itches.
- Call your doctor or therapist if you notice any tearing or separation of the stitches.
- Call your doctor or therapist if you notice that the skin around the stitches is red or swollen or if you notice any pus draining from the stitches.
- Rewrap your residual limb at least 4 or 5 times a day to maintain proper compression. This not only reduces the swelling and increases circulation and healing, but also reduces pain.
- Get new elastic bandages if the ones you are using become soiled or lose their stretchiness.

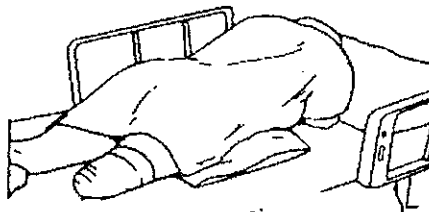
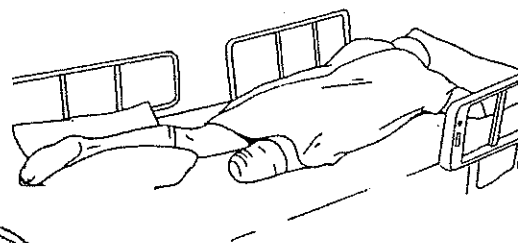
# General Positioning for Lower Extremity Amputation

Follow these instructions for both above and below the knee amputation

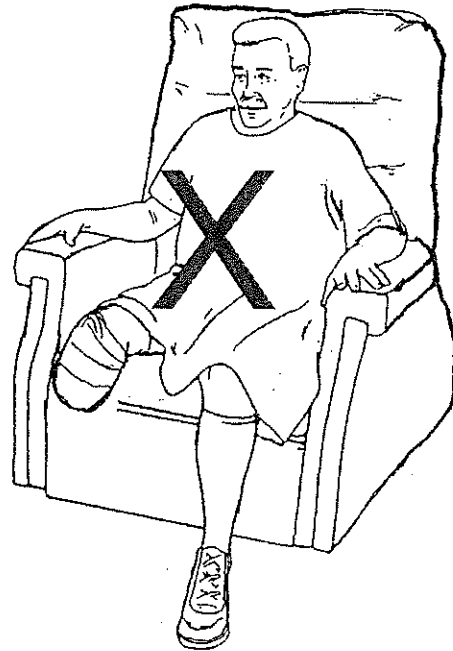
- Avoid excessive pillows under your residual limb with hip flexion or abduction unless advised by your physician.



- Lie with your pelvis level, and your hips in neutral rotation. Use a pillow or towel rolled up to help you keep in this position.
- Advance to lying on stomach as tolerated, cushion sound limb to protect your foot. You may use bridge padding to improve initial tolerance.



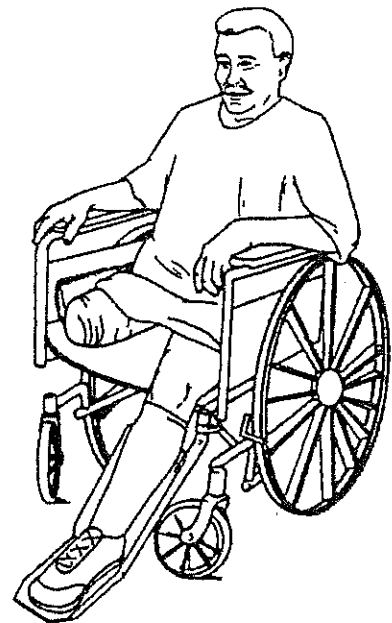
- Avoid prolonged sitting or lack of limb support.



- Maintain residual limb support with knee straight.
- Use wheelchair if possible to promote mobility.



- Sit multiple times for shorter periods with outside of your limb supported.
- Use a wheelchair if possible to promote activity.



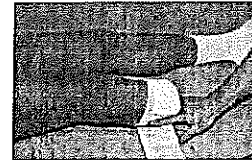
# Application Instructions for Removable Rigid Dressing (RRD)

The removable rigid dressing is used as a dressing after surgery for below the knee amputation. The dressing controls the swelling that is common following amputation surgery. It acts as a protective shield to the amputation wound, and still lets you see the wound. Reapplication provides the caregiver the opportunity to increase the compression to the limb as necessary, promoting healing and residual limb maturity. This technique has reduced the incidence or severity of knee flexion contracture and has allowed earlier prosthetic fittings with higher success rates than previous post-surgical management.

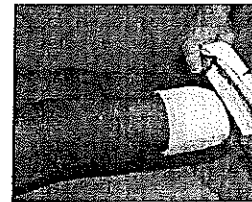
- A sterile non-adherent dressing such as Adaptic or Telfa is applied to any open or draining areas of the wound.



- A soft cling “conforming bandage” is gently applied to the lower part of the residual limb. Use only as much bandages as necessary. Avoid a bulky accumulation of bandage material.



- A soft sock, which is a two-ply, two-way stretch sock, is applied snugly over the limb. This is sock #1.



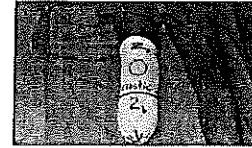
- A double stretch elastic tubular stockinet is applied to the residual limb. This is sock #2.



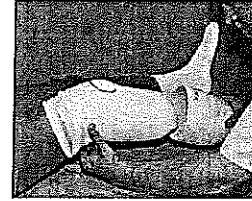
- Pull the tubular stocking up to cover the knee by three to four inches. Then twist it snugly about 90 degrees at the distal end of the residual limb.



- Pull the stockinet up towards the knee again.



- Prosthetic socks, either multiple single-ply socks, or a multi-ply sock of the proper thickness, are applied snugly to the limb.
- Make sure there are no wrinkles and multiple socks are always applied one layer at a time.



- A thin nylon sheath, Nysert, is then applied snugly to the limb. This provides a smooth and slick surface to aid in future dressing removals.
- When the patient is lying in bed, the knee immobilizer should be used to prevent knee flexion contractures.



- When the patient is sitting, walking with a walker, or doing physical therapy, the knee immobilizer should be removed and the BK suspension sleeve should be pulled high onto the thigh.
- This enables knee flexion while maintaining good cast suspension.
- The RRD should remain in good contact with the end of the residual limb at all times.



# Below Knee Prosthesis Instructions- For systems with roll-on gel liners with pins.

- Roll on liner with no air trapped inside.
- Make sure the pin is located in the center. Check the front and side views.



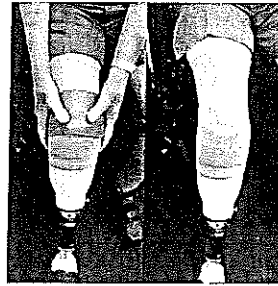
- Add socks with holes if required.
- Put residual limb in socket with the pin directed at the hole in the bottom.



- Rest the heel of the prosthesis on the floor with the knee flexed about 45 degrees.
- With the palms of your hands resting on your knee, mildly push until the pin "clicks".



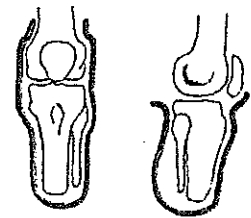
- If the pin will not click, pull the heel back a few inches. The knee should be flexed less than 90 degrees.
- Press with both palms on your knee again. Keep alternating these two positions until the pin clicks.



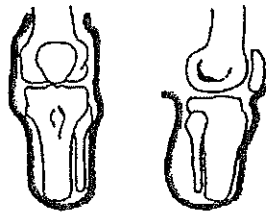
- Ideally, you should get 1 to 2 clicks sitting down; stand up to get clicks 3 and 4, then walk to get clicks 5 and 6. There should be a total of 6 clicks for a short pin.
- There should be mild resistance to achieving clicks sitting, standing, and walking. If all clicks happen easily while you are sitting down, the socket is loose. Remove the prosthesis, add socks and start again.

- The position of the knee cap should rest in the sock as shown here:

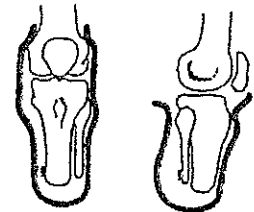
Normal



Too Snug



Too Loose



- Check the sock fit throughout the day. As the day goes on, volume is lost and socks will need to be added. Pain at the bottom of the limb feels the same whether you have too few or too many socks. If you have too few, there is often pressure at the base of the knee cap as well as at the bottom. With too many socks, there is often pressure on the sides of the knee as well as the bottom.
- If you have trouble removing the prosthesis: Before pushing the pin, put weight on the prosthesis, either while sitting or standing. Then push the pin and hold it in while lifting the limb out of the socket. When adding socks, make sure they are pulled up and no fabric is resting on the pin.

## Cleaning the liners

- Gel liners come in pairs. Wear a clean liner everyday that was not worn the day before. Liners need 24 hours to dry and “restore” their shape and condition.
- Turn the liner inside out to wash the gel side. Rinse with water and lather surface with a small amount (1-2 squirts) of liquid soap. Use non-scented antibacterial soap, such as Softsoap or Ivory. Do not use Dial antibacterial soap. Never “scrub” the surface of the gel.
- Rinse well, making sure no soap residue remains on the gel surface.
- Blot the liner dry on a lint-free towel.
- Return the liner to right side (fabric side) out and allow to dry on the stand provided. It is okay if the fabric side gets wet. Allow the liner to air dry away from any direct or indirect heat sources.

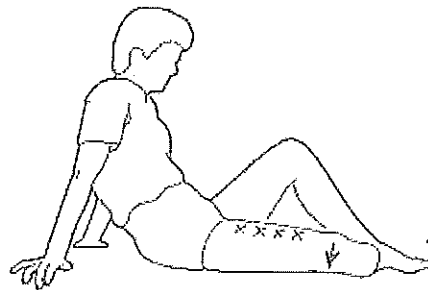
# Basic Lower Extremity Amputation

## Exercises

Do these sessions \_\_\_\_ a day.

### Quad Set

- Keep your residual limb straight and bend your other leg. Keep your legs close together.
- Straighten the knee on your residual limb as much as possible, tightening the muscles on the top of your thigh.
- Hold for five seconds and then relax.
- Repeat \_\_\_\_ times.

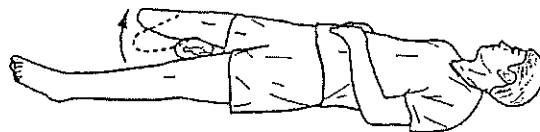


### Glut Sets

- Keep both legs straight and close together.
- Squeeze your buttocks together as tightly as possible.
- Hold for five seconds, and then relax.
- Repeat \_\_\_\_ times.

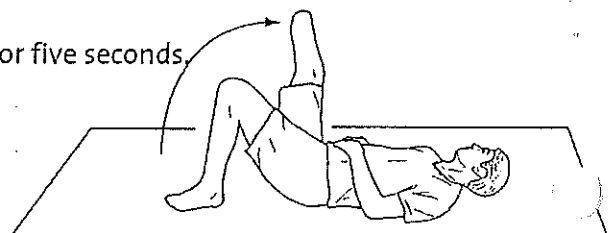
### Short Arc Knee Kick

- With your residual limb resting on a bolster, straighten your knee by tightening the muscles on top of your thigh.
- Keep the bottom of your knee on the bolster.
- Repeat \_\_\_\_ times.



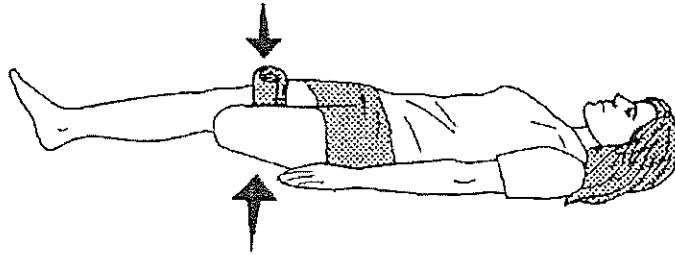
### Straight Leg Raises

- Keep your residual limb straight and bend the other leg. Keep your legs close together.
- Straighten your residual limb as much as possible, tightening the muscles on the top of your thigh.
- Raise your residual limb off the floor four inches and hold for five seconds.
- Slowly return to the starting position, and relax.
- Repeat \_\_\_\_ times.



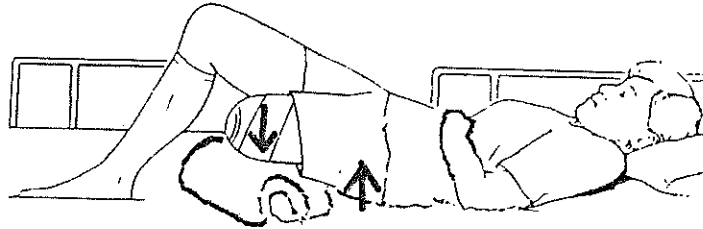
## Hip Adduction

- Keep both legs straight.
- Place a rolled towel between your legs.
- Squeeze the towel between your legs for five seconds, and then relax.
- Repeat \_\_\_ times.



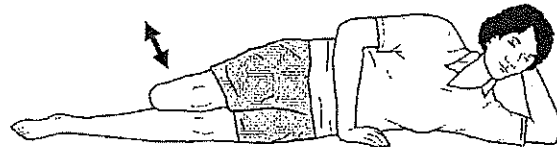
## Bridging

- Lie on your back with your head on a pillow and your arms folded across your chest.
- Place a rolled towel under your residual limb.
- Keep your residual limb straight and bend your other leg.
- Push your residual limb down into the towel as you squeeze your buttocks together and lift them up off the floor.
- Hold for five seconds, and then relax.
- Repeat \_\_\_ times.



## Hip Abduction, Side Lying

- Lie flat on your side, residual limb up.
- Bend your bottom leg backwards for support.
- Slowly lift your residual limb upward, taking care not to roll your body forward or backwards.
- Slowly return to the starting position and relax.
- Repeat \_\_\_ times.



## Hip Extension, Lying

- Lie flat on your stomach with your arm folded under your head.
- Keep both legs straight and close together.
- Lift your residual limb off the floor just enough to clear the other thigh. Be sure to keep your stomach flat on the floor.
- Return to the starting position and relax.
- Repeat \_\_\_ times.



# Advanced Exercises for People with Lower-Extremity Amputations

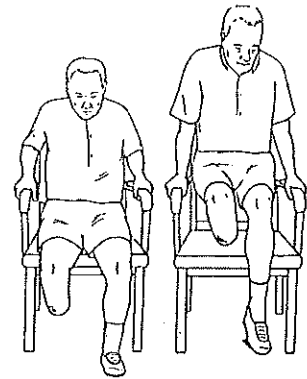
Be sure to check with your physician or physical therapist before beginning any exercises. Your fitness level, your general health, and the condition of your residual limb will all play a role in how rigorously you can exercise. A qualified health professional can teach you how to stay within your target heart rate.

## Strength Exercises

Strength is needed in each leg, your arms and your trunk, which includes your stomach and back. In addition to your legs, your stomach and back muscles play a crucial role in standing and moving. If your trunk is not strong, it will not be able to hold up to the demands you make on it all day every day.

### Seated push up

Place a stable chair against a wall to prevent it from tipping over. While sitting in the chair, place your hands on the armrests. Push down into the armrests to raise your hips one to two inches off the seat and then rest.



### Partial squats

Hold onto a sturdy piece of furniture or the kitchen sink. Place even weight onto both legs, and simply squat as if you are sitting on a very tall stool. You are not working toward a full squat. Do this 10 times. Exercising the muscles of your thighs will make it easier to sit and rise from a chair.



### Wall squat (More advanced)

Stand with your back against the wall beside a sturdy piece of furniture in case you need additional support. Slowly slide your body down the wall until your knees are slightly bent. To make this exercise more difficult, slide a little lower down the wall or do this on one leg. You can stand on your intact leg or your prosthetic leg. Hold this position for five to 30 seconds. Be sure to breathe the entire time you perform this exercise. Holding your breath is bad for your heart. If your amputation is above the knee, you will need to do this exercise on your intact leg only since most prosthetic knees will not support your weight if there is too much bend in the knee.



### Pelvic tilt

While on your back, with or without your prosthesis, bend both hips and knees to 90 degrees. Place your hands on your thighs just above your knees, and flatten the small of your back by pressing down with your stomach muscles. Do not allow your thighs to move. Hold this position for two to three seconds while breathing normally. This exercise strengthens the abdominal muscle (stomach). You can make this exercise more difficult by lifting your head.



### Balance Exercises

One of the most difficult rehabilitation activities is retraining you and your brain to accept weight into the socket of your prosthesis. To use your prosthesis and its foot and knee components to their fullest advantage, you must put all of your weight into the socket and use all of your leg muscles to control it. Though it will be difficult to learn to use your remaining leg muscles to balance on each leg while standing and walking, it will pay off in a smoother, less tiring gait.

### Even weight bearing

While standing in line, shaving, or brushing your teeth, think about how much weight you have on each leg. Do you stand with most of your weight on your unaffected leg? Many people with an amputation shift all of their weight onto the unaffected leg and use the prosthesis only as a perch. Stand with your weight evenly on both legs while performing one typical daily task, such as talking on the telephone. By increasing your awareness and changing this one simple habit, you can improve your balance on a daily basis.

### All fours

While on your hands and knees, begin by raising one arm in front of you. Put your arm down. Now try to raise a leg behind you. When you can do this with ease, raise your opposite arm and leg together, hold them for two to three seconds while breathing, and relax. Then switch sides. Keep your eyes down so that you do not strain your neck, and keep your back flat.



### Kick ball

Practice this fun exercise with a friend. While you are up against a wall or using a chair, alternate kicking a ball with one leg and then the other. Quickly changing the leg that you kick with will help improve your balance and coordination.



### Hip lift

If you do not use a prosthesis, or when you are not wearing one, be aware of how you hold your hip. If you tend to slouch, tighten the muscles of your standing leg to even out your hips.



### Uneven surfaces

A good way to work on your balance is to make the surface on which you are standing uneven. Place a pillow or cushion on a carpet and stand on it. You might want to rest your hands on a table top. For safety, be sure the pillow is on carpet and not a slick surface. Sway side-to-side, and then back and forth, slightly or reach for something on the counter. You will need to tighten the muscles of your residual limb inside the prosthetic socket

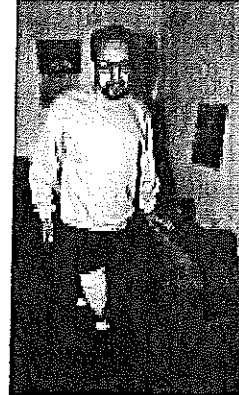


### Agility Exercises

Once you have mastered balance activities, you will find that you are moving more easily. It is also likely that you will be doing more, and you may find that you occasionally need to move faster, slower, backwards or sideways. By practicing the following exercises and varying the speed and step length, you will improve your agility and accomplish tasks with more confidence.

### Braiding

Using the back of your couch for balance assistance, take a few steps to one side crossing your prosthetic leg in front of and then behind your unaffected leg. Stand as straight as you can and try to use your hands for balance only. If your amputation is above the knee, be sure to take small steps ensuring that you don't put too much weight on the toe of your prosthesis, which could cause the knee to bend.



### Circle

Walk around a chair in each direction.

### Ball toss

Do this exercise with a friend. If you are using a prosthesis and really want to challenge your balance, stand up to catch the ball. If you are not using a prosthesis or are just beginning this exercise, sit while you catch the ball. This exercise requires strength, coordination, balance and agility, and it's fun!



### Endurance Exercises

You have already been improving your endurance by working on your range of motion, strength, balance and agility. Every time you do an extra repetition, use a heavier weight, or spend more time exercising, you are improving your endurance. To focus more on endurance, you simply need to work a little harder and a little longer at the things you have already been doing. You might also add an aerobic activity. If you have access to a stationary bike, a treadmill, a rower or a pool, you can use it to improve your endurance. And, of course, there is always just plain walking. It is a good idea to seek the assistance of a health professional to determine your current level of fitness and your target heart rate (THR). You do not want to stress your heart too much or too little. Once you learn your THR and how to take your pulse, you will be able to do effective endurance activities with confidence.

### Stationary bike

If you have a stationary bike, get on it! Stop using it as a clothes rack. You can ride a bike with one leg. It may help to have a strap to hold your foot in place. If you cannot get on your bike, lay in bed or on the floor and move your legs like you were pedaling a bike.

If you are interested in doing more exercise or have specific concerns, a physical therapist who has experience working with people with amputations can help you.

Try to set a goal. Break it down into small bits, and make exercise a part of your daily plan, you will find that it becomes a good habit. Set aside some time each day to work on one of these activities, get a friend to join you, play some music and have some fun. Applaud your efforts, great and small, and you will keep moving.