

Residual limb care

Revised: February 20, 2023

■ Introduction

Patient care immediately after limb amputation includes monitoring drainage from the residual limb, controlling pain, reducing edema, positioning the affected limb, assisting with exercises prescribed by a physical therapist, and wrapping and conditioning the residual limb. Postoperative care of the residual limb varies slightly depending on the amputation site (arm or leg) and the type of dressing applied to the residual limb (elastic bandage or plaster cast).

After the residual limb heals, it requires routine daily care, including proper hygiene and continued muscle-strengthening exercises. During recovery from the physical and psychological trauma of amputation, the patient needs to learn correct procedures for routine daily care of the residual limb.

■ Equipment

For postoperative residual limb care

- 1" (2.5-cm) adhesive tape or bandage clips
- Absorbent pad
- Bath supplies
- Disinfectant pad
- Elastic residual limb shrinker or 4" to 6" (10- to 15-cm) elastic bandages with clips or tape
- Facility-approved pain assessment tool
- Gentle, nondetergent soap, water and towel
- Gloves
- Overhead trapeze
- Pillows or other positioning devices
- Stethoscope
- Trochanter roll (for a leg)
- Vital signs monitoring equipment
- Optional: gown, mask with a face shield or a mask and goggles, prescribed pain medication, prescribed skin and wound care products, pressure dressing, tourniquet

For ongoing residual limb care

- Gentle nondetergent soap
- Residual limb sock
- Washcloth and towel

■ Preparation of Equipment

Inspect all equipment and supplies. If a product is expired, is defective, or has compromised integrity, remove it from patient use, label it as expired or defective, and report the expiration or defect as directed by your facility.

■ Implementation

- Verify the practitioner's order.
- Review the patient's medical record for surgical details, such as the date of amputation, reason for amputation, and location of amputation.
- Gather and prepare the necessary equipment and supplies.
- Perform hand hygiene.^{1 2 3 4 5 6}
- Confirm the patient's identity using at least two patient identifiers.⁷
- Provide privacy.^{8 9 10 11}
- Explain the procedure to the patient and family (if appropriate) according to their individual communication and learning needs *to increase their understanding, allay their fears, and enhance cooperation.*¹²
- Raise the bed to waist level before providing care *to prevent caregiver back strain.*¹³
- Perform hand hygiene.^{1 2 3 4 5 6}
- Put on gloves and, as needed, other personal protective equipment *to comply with standard precautions.*^{14 15 16}
- Perform routine postoperative care. Frequently assess the patient's respiratory status and level of consciousness, monitor IV infusions, assess tube patency, and provide for the patient's comfort, pain management, and safety. Monitor vital signs at an interval determined by your facility and the patient's condition; *no evidence-based research indicates the best practice for the frequency of monitoring vital signs.* (See the "[Postoperative care](#)" procedure.)¹⁷

Monitoring residual limb drainage

- Inspect the dressing frequently to assess the amount of blood and drainage on it *because gravity causes fluid to accumulate at the residual limb.* Notify the practitioner if the accumulation of drainage or blood rapidly increases. If excessive bleeding occurs, notify the practitioner immediately and apply a pressure dressing or compress the appropriate pressure points. If doing so doesn't control bleeding, use a tourniquet only as a last resort and notify the practitioner.

- Tape an absorbent pad over the moist part of the dressing, as needed. *Doing so provides a dry area to help prevent bacterial infection.*

Positioning the extremity

- Elevate the extremity for the first 24 to 48 hours, as ordered, *to reduce swelling and promote venous return.*¹⁸
- For an arm amputation, position the patient's arm with the elbow extended and the shoulder abducted *to prevent contractures.*
- For a leg amputation, elevate the foot of the bed slightly and place a trochanter roll against the patient's hip *to prevent external rotation.*

◆ **Clinical alert:** Don't place a pillow under the patient's thigh to flex the hip *because this positioning can cause hip flexion contractures.* For the same reason, tell the patient to avoid prolonged sitting.¹⁸ ◆

- After a below-the-knee amputation, maintain knee extension *to prevent hamstring muscle contractures.*
- After any level of leg amputation, place the patient on a firm surface in the prone position for at least 2 hours daily with the legs close together and without pillows under the stomach, hips, knees, or residual limb, unless this position is contraindicated. *This position helps prevent hip flexion, contractures, and abduction; it also stretches the flexor muscles.*

Assisting with prescribed exercises

- After arm amputation, encourage the patient to exercise the remaining arm *to prevent muscle contractures.* Help the patient perform isometric and range-of-motion (ROM) exercises for both shoulders, as prescribed by the physical therapist, *because the use of a prosthesis requires both shoulders.*
- After leg amputation, stand behind the patient and (if needed) provide support with your hands at the patient's waist during balancing exercises.
- Instruct the patient to exercise the affected and unaffected limbs *to maintain muscle tone and increase muscle strength.* A patient with a leg amputation may perform push-ups, as ordered (in the sitting position with the arms at the sides), or pull-ups on the overhead trapeze *to strengthen the arms, shoulders, and back in preparation for using crutches.*

Wrapping and conditioning a residual limb

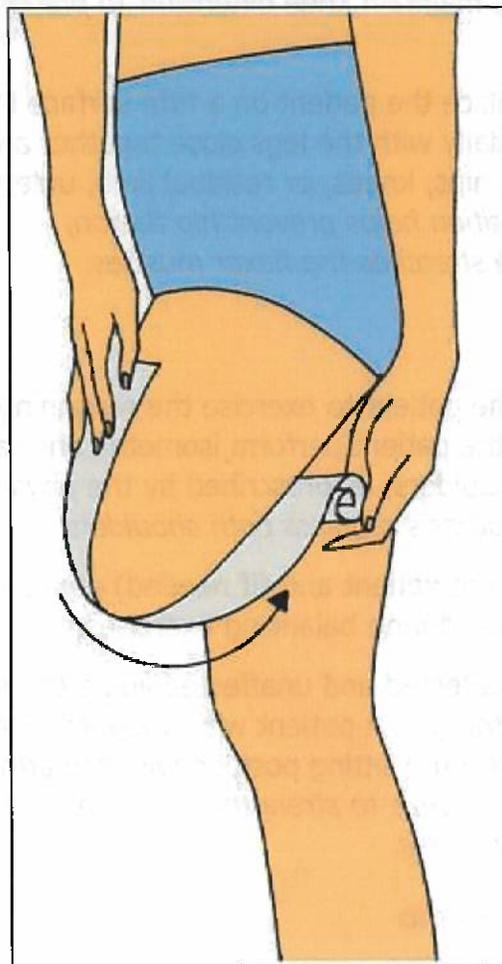
- Apply an elastic residual limb shrinker *to prevent edema and shape the limb in preparation for the prosthesis.* Wrap the residual limb so that it narrows toward the distal end *to help ensure comfort when the patient wears the prosthesis.*
- If an elastic residual limb shrinker isn't available, wrap the residual limb of an amputated leg in a 4" to 6" (10- to 15-cm) elastic bandage. To do this, stretch the bandage to about two-thirds its maximum length as you wrap it diagonally around the residual limb, with the greatest pressure distally. (Depending on the

size of the leg, you may need to use two elastic bandages.) Secure the bandage with clips or adhesive tape. Make sure that the bandage covers the residual limb smoothly *because wrinkles and exposed areas encourage skin breakdown.* (See [Wrapping a residual limb.](#))

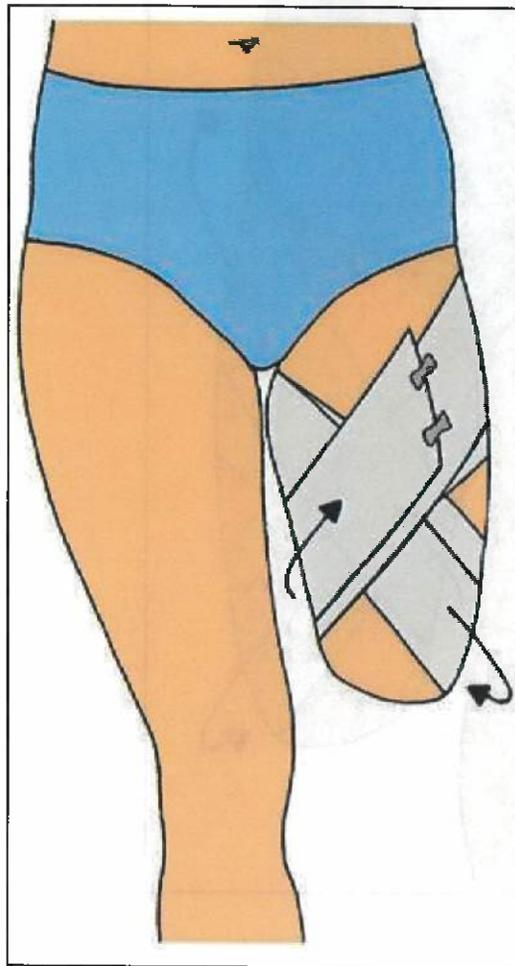
WRAPPING A RESIDUAL LIMB

Proper residual limb care helps protect the limb, reduces swelling, and prepares the limb for a prosthesis. As you perform the procedure, teach it to the patient.

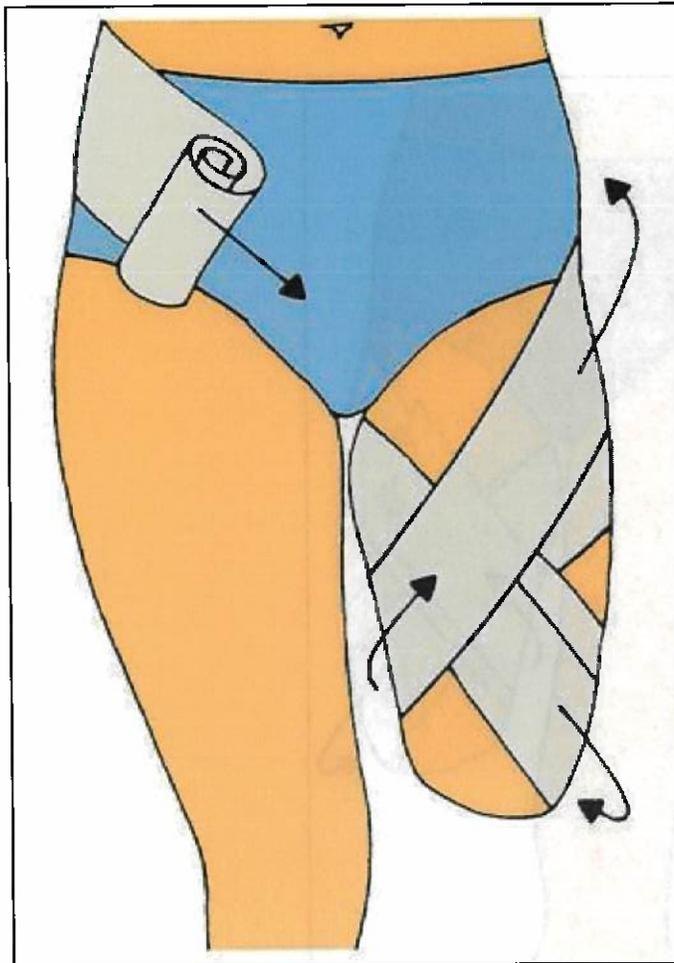
Start by elevating the residual limb *to reduce edema and vascular stasis.*¹⁸ Obtain two 4" to 6" (10- to 15-cm) elastic bandages. Center the end of the first bandage at the top of the patient's thigh. Unroll the bandage down over the residual limb and to the back of the leg (as shown below).



Make three figure-eight turns to adequately cover the ends of the residual limb (as shown below). As you wrap, be sure to include the roll of flesh in the groin area. Use enough pressure to ensure that the residual limb narrows toward the end *so that it fits comfortably into the prosthesis.*



Use the second bandage to anchor the first bandage around the patient's waist (as shown below). For a below-the-knee amputation, use the patient's knee to anchor the bandage in place. Secure the bandage with clips or adhesive tape. Check the residual limb bandage regularly and rewrap it if it bunches at the end.



- To wrap an amputated arm, follow the same technique as described for the leg using a 4" (10-cm) elastic bandage and wrapping the patient's remaining arm using figure-eight turns until you cover the entire residual limb. Pass the bandage wrap across the patient's back and shoulders *to anchor it*. Then secure the bandage with clips or adhesive tape.
- If the patient experiences throbbing after you wrap the residual limb, the bandage may be too tight; remove the bandage immediately and reapply it less tightly. *Throbbing indicates impaired circulation.*
- Unwrap the residual limb every 4 to 6 hours for the first 2 days postoperatively, as prescribed, and then at least once daily.^[18] Assess for signs and symptoms of infection and skin irritation or breakdown. Assess the color, temperature, and most proximal pulse on the residual limb, comparing findings to those on the opposite extremity.^[18] Report findings to the practitioner.
- After removing the bandage, massage the residual limb gently, always pushing toward the suture line rather than away from it. *Massage stimulates circulation and prevents scar tissue from adhering to the bone.*
- Perform residual limb skin and wound care as needed and prescribed.^[18]

- When healing begins, instruct the patient to push the residual limb against a pillow. Then have the patient progress gradually to pushing against harder surfaces, such as a padded chair and then a hard chair. *These conditioning exercises help the patient adjust to experiencing pressure and sensation in the residual limb.*^[18]

Caring for a healed residual limb

- *To shape the residual limb*, have the patient wear an elastic bandage 24 hours per day, except while bathing.
- *To prevent infection*, bathe the residual limb, but never shave it. If possible, bathe the residual limb at the end of the day *because warm water can cause swelling, making prosthesis reapplication difficult*. Don't soak the residual limb for long periods.
- Avoid applying lotions, oils, and creams to the residual limb, unless prescribed. *These products can clog follicles, which increases the risk of infection.*^[18]
- Inspect the residual limb for redness, swelling, breakdown, and calluses. Report any of these findings to the practitioner. Tell the patient to avoid putting weight on the residual limb. (The skin should be firm but not taut over the bony end of the limb.)
- Continue muscle-strengthening exercises *so that the patient can build the strength needed to control the prosthesis*.
- Change and wash the patient's elastic bandages or residual limb sock every day *to avoid exposing the skin to excessive perspiration, which can lead to skin breakdown.*^[19] Wash the elastic bandages in warm water and gentle, nondetergent soap; lay them flat on a towel to dry. *Machine washing and drying may shrink the elastic bandages.*

Completing the procedure

- Return the bed to the lowest position *to prevent falls and maintain the patient's safety.*^[20]
- Discard used supplies in appropriate receptacles.^[16]
- Remove and discard your gloves and, if worn, other personal protective equipment.^{[14] [16]}
- Perform hand hygiene.^{[1] [2] [3] [4] [5] [6]}
- Clean and disinfect your stethoscope with a disinfectant pad.^{[21] [22]}
- Perform hand hygiene.^{[1] [2] [3] [4] [5] [6]}
- Document the procedure.^{[23] [24] [25] [26]}

Special Considerations

- Note that you may apply semirigid or rigid residual limb dressings or an immediate postoperative prosthesis (IPOP) after amputation. A rigid dressing is intended to prevent contractures. An IPOP is intended to reduce the time to

ambulation with a full prosthetic.^[27] Assess the surgical dressings for integrity and drainage and remove and replace them, as ordered. Some designs require training in their proper application.^[18]

- Ensure adequate postoperative pain control. *Optimal pain management may reduce the risk of phantom pain.*^[27]
- Nonpharmacologic therapies, such as transcutaneous electrical nerve stimulation, acupuncture, spinal cord stimulation, virtual reality therapy, and mirror therapy, may be used to manage phantom limb pain.^[27]

■ Patient Teaching

Emphasize to the patient that proper care of the residual limb can help speed healing, prevent complications, and promote mobility and function. Teach the patient to inspect the residual limb carefully every day using a mirror and to continue proper daily residual limb care. Instruct the patient to call the practitioner if the incision appears to be opening, looks red or swollen, feels warm, is painful to the touch, or is seeping drainage.^[28]

Make sure that the patient knows the signs and symptoms that indicate problems in the residual limb. Explain that a 10-lb (4.5-kg) change in body weight will alter the residual limb size and require a new prosthesis socket *to ensure a correct fit*.

Tell the patient to massage the residual limb toward the suture line *to mobilize the scar and prevent its adherence to bone*. Advise the patient to avoid exposing the skin around the residual limb to excessive perspiration, which can be irritating. Tell the patient to change the elastic bandages or residual limb sock daily to avoid this irritation.

Explain that the patient may experience twitching, spasms, or phantom limb sensations (such as pain, warmth, cold, or itching) as the residual limb muscles adjust to amputation. Tell the patient that phantom limb pain is usually most severe soon after amputation and then decreases over time. Explain that phantom limb pain is also more common when the prosthesis isn't attached. Such measures as heat, massage, gentle pressure, imagery, biofeedback, and distraction may be helpful in relieving phantom limb pain and other sensations.^[29]^[30]

Inform the patient that exercise of the remaining muscles in an amputated limb must begin the day after surgery. A physical therapist will direct these exercises. For example, arm exercises progress from isometrics to assisted ROM to active ROM. Leg exercises include rising from a chair, balancing on one leg, and ROM exercises of the knees and hips. Stress the importance of performing prescribed exercises *to help minimize complications, maintain muscle strength and tone, prevent contractures, and promote independence*. Also stress the importance of positioning *to prevent contractures and edema*.

■ Complications

Complications associated with residual limb care may include:

- Postoperative complications

- hemorrhage
- infection
- contractures
- edema
- skin breakdown
- phantom limb pain
- altered body image and grieving
 - withdrawal
 - depression
- stump hematoma²⁷
- deep vein thrombosis²⁷

■ Documentation

Documentation associated with residual limb care includes:

- date and time of your observations
- specific procedures performed for all postoperative care
 - amount and type of drainage
 - presence and appearance of any drains
 - condition of the dressing
 - need for dressing reinforcement
 - appearance of the suture line and surrounding tissue
 - pain assessment findings
 - signs of skin irritation or infection
- complications
- practitioner notification (if any)
 - date and time of practitioner notification
 - practitioner's name
 - interventions performed
 - patient's response to those interventions
- patient's tolerance of exercises
- patient's psychological reaction to the amputation
- routine daily care provided
 - date and time of care

- type of care provided
- condition of the skin and suture line
- signs of irritation (such as redness and tenderness)
- patient's progress in caring for the residual limb or prosthesis
- teaching provided to the patient and family (if applicable)
 - understanding of that teaching
 - follow-up teaching needed.

This procedure has been reviewed by the Academy of Medical-Surgical Nurses.



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(Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions)

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Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions

The following leveling system is from *Evidence-Based Practice in Nursing and Healthcare: A Guide to Best Practice* (2nd ed.) by Bernadette Mazurek Melnyk and Ellen Fineout-Overholt.

- Level I: Evidence from a systematic review or meta-analysis of all relevant randomized controlled trials (RCTs)
- Level II: Evidence obtained from well-designed RCTs
- Level III: Evidence obtained from well-designed controlled trials without randomization
- Level IV: Evidence from well-designed case-control and cohort studies
- Level V: Evidence from systematic reviews of descriptive and qualitative studies
- Level VI: Evidence from single descriptive or qualitative studies
- Level VII: Evidence from the opinion of authorities and/or reports of expert committees

Modified from Guyatt, G. & Rennie, D. (2002). Users' Guides to the Medical Literature. Chicago, IL: American Medical Association; Harris, R.P., Hefland, M., Woolf, S.H., Lohr, K.N., Mulrow, C.D., Teutsch, S.M., et al. (2001). Current Methods of the U.S. Preventive Services Task Force: A Review of the Process. American Journal of Preventive Medicine, 20, 21-35.

