Traumatic amputation wound care

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Introduction

Traumatic amputation is the severing of part of the body, a limb, or part of a limb. When caring for a patient with a traumatic amputation, the first priority is to assess circulation, airway, and breathing.[1] After stabilizing the patient's circulation, airway, and breathing, the focus is on addressing the traumatic amputation wound. Initial management concentrates on controlling bleeding (usually by applying firm, direct pressure and elevating the extremity).[2] If bleeding continues, pressure point compression may be required. Other nursing interventions include assessing and covering the wound and preparing the patient for surgery, if indicated.

Equipment

- Adhesive film dressing
- Cardiac monitor with leads and electrodes
- Facility-approved pain assessment tool
- Gloves
- IV administration set
- Light source
- Prescribed antibiotics
- Prescribed IV fluids
- Pulse oximeter and probe
- Sterile 4″ × 4″ (10- × 10-cm) gauze pads
- Sterile basin
- Sterile normal saline solution
- Vital signs monitoring equipment
- Optional: blood sample collection equipment, digital camera, irrigation equipment, IV catheter insertion equipment, other personal protective equipment, oxygen, oxygen delivery system, prescribed pain medication, splint, tetanus toxoid vaccine or tetanus immune globulin and administration supplies, tourniquet

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. Ensure that the digital camera is charged and maintained according to the manufacturer's instructions *to ensure its functionality.* Fill a sterile basin with sterile normal saline solution. Make sure that the treatment area has sufficient light *to enable close observation of the traumatic amputation wound.*

Implementation

- Gather and prepare the necessary equipment and supplies.
- Perform hand hygiene.[3][4][5][6][7][8]
- Put on gloves and, as needed, other personal protective equipment *to comply with standard precautions*.[9][10][11]
- Confirm the patient's identity using at least two patient identifiers.[12]
- Assess the patient's circulation, airway, and breathing. If necessary, begin cardiopulmonary resuscitation. (See the "Cardiopulmonary resuscitation [CPR], two-person" procedure.)[1]
- Provide privacy.[13][14][15][16]

- 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.*[17]
- Raise the bed to waist level before providing care *to prevent caregiver back strain.*[18]
- Remove the patient's clothing, if necessary, *to expose the traumatic amputation wound.*
- Control bleeding by applying direct pressure to the traumatic amputation wound using sterile gauze pads, elevating the injured area, or applying compression to pressure points (if necessary). If bleeding continues, apply a tourniquet as close to the amputation site as possible.[19][20]

◆ ***Clinical alert:*** Keep in mind that prolonged tourniquet use may cause complications, including compartment syndrome, nerve palsy, damage to blood vessels, thrombosis, pressure injuries, and further amputation related to tourniquet pressure and duration of occlusion. A time beyond which irreversible complications may occur has not been determined; however, a recent study found that tourniquet use for longer than 2 hours was associated with amputation and fasciotomy but not other morbidities. It's essential to communicate the time a tourniquet is first applied to emergency medical service providers and emergency department staff.[21] ◆

- Obtain a history from the patient (or from an eyewitness to the injury or a family member), if possible, that includes the date, time, and mechanism of injury; information about any contaminants present; the type, size, or weight of any instrument or machinery involved; details about the instrument, including whether it was dull or sharp; the angle and speed of penetration; the environment in which the injury occurred; and the date of the patient's last tetanus immunization.[20] Also, inquire about any allergies to latex, medications, or dressing materials.
- Ask about risk factors that may complicate wound healing, such as diabetes mellitus, stage 5 kidney disease, peripheral vascular disease, human immunodeficiency virus infection, immunosuppressive drug or anticoagulant use, and bleeding disorders.[22]
- Attach the patient to a continuous cardiac monitor, pulse oximeter, and automated blood pressure device as indicated. Make sure alarm limits are set appropriately for the patient's current condition and that alarms are turned on, functioning properly, and audible to staff.[23][24][25][26]
- Obtain the patient's vital signs and assess for signs of shock, such as hypotension, tachycardia, diminished pulses, altered level of consciousness, and pallor. Also, assess for other injuries.[20]
- Administer supplemental oxygen as prescribed.[27] (See the "Oxygen administration" procedure.)
- Insert an IV catheter as ordered if the patient doesn't already have one in place.[20] (See the "IV catheter insertion" procedure.) Administer IV fluids as prescribed.
- Screen for and assess the patient's pain using facility-defined criteria that are consistent with the patient's age, condition, and ability to understand.[28]
- Treat the patient's pain, as needed and ordered, using nonpharmacologic, pharmacologic, or a combination of approaches. Base the treatment plan on evidence-based practices and the patient's clinical condition, past medical history, and pain management goals.[28] Administer pain medication, as needed and ordered, following safe medication administration practices; *administering pain medication as soon as possible after injury controls acute pain and reduces the risk of chronic pain.*[28][29][30][31][32][33]
- Monitor closely if the patient is at high risk for adverse outcomes related to opioid treatment, if prescribed.[28]
- If directed to photograph the wound by your facility, obtain consent for photography and photograph the wound.[27] (See the "Wound photography" procedure.)
- For a complete amputation, irrigate the severed limb with sterile normal saline solution *to remove gross contamination.*[27]
- For a partial amputation, support the limb and splint it in a position of anatomic function.[27]
- Remove jewelry near the amputation site *to prevent neurovascular compromise because swelling occurs in response to the injury.*[2]
- Cover the wound with sterile gauze pads that have been soaked in sterile normal saline solution and then cover the gauze with an adhesive film dressing *to prevent evaporation.* Avoid repeated wound inspection and dressing changes *because they increase the risk of infection.*
- Administer antibiotics as ordered following safe medication administration practices *to prevent infection.*[27][29][30][31][32][33]

- Obtain blood samples for coagulation studies, hemoglobin level, hematocrit level, electrolyte levels, and typing and crossmatching as ordered *in case blood transfusion is necessary.*[20] (See the "Venipuncture" procedure.)
- Administer the tetanus toxoid vaccine or tetanus immune globulin as needed and prescribed following safe medication administration practices.[2][27][30][31][32][33]
- Preserve the severed body part. (See *Caring for a severed body part* .)

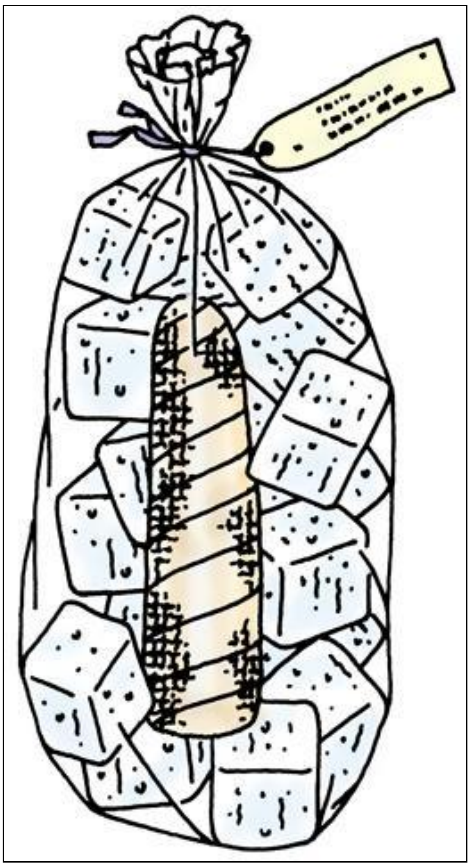
CARING FOR A SEVERED BODY PART

After traumatic amputation, a surgeon may be able to reimplant the severed body part through microsurgery. The chance of successful reimplantation is much greater if the severed body part has received proper care.

If a patient arrives at the hospital with a severed body part, first make sure that bleeding at the amputation site has been controlled. Then, follow these guidelines for preserving the body part:

- Perform hand hygiene.[3][4][5][6][7][8]
- Put on sterile gloves.[9][10][11]
- Place several sterile gauze pads and an appropriate amount of sterile roller gauze in a sterile basin. Pour sterile normal saline or sterile lactated Ringer solution over them. Never use any other solution, and don't try to scrub or debride the body part.
- While holding the severed body part in one gloved hand, wash the body part using the moistened sterile gauze pads.[20]
- Place saline-moistened gauze pads over the severed body part end, and then wrap the whole body part with saline-moistened roller gauze. Wrap the gauze with a similarly moistened sterile towel, and place the wrapped body part in a plastic bag or other watertight container and seal it.[2][20]
- Place the sealed package in an insulated cooling chest with crushed ice, being careful not to freeze the severed body part.[20] Alternatively, fill another plastic bag with ice and water *to make an ice-water slurry,* and place the body part (still in its watertight container) inside the outer bag; seal the outer bag. (Always protect the body part from direct contact with ice—and never use dry ice—*to prevent irreversible tissue damage, which would make the body part unsuitable for reimplantation.*) Keep this bag ice-cold until the surgeon is ready to perform the reimplantation surgery.[2]
- Label the bag with the patient's name and identification number, identification of the severed body part, the hospital identification number, and the date and time when cooling began.[2]

Note: You must wrap and cool the severed body part quickly. *Irreversible tissue damage occurs after only 6 hours at ambient temperature;* however, hypothermic management seldom preserves tissues for longer than 24 hours.



- Arrange for an X-ray of the extremity, if ordered.
- Prepare the patient for surgery as indicated.
- Return the bed to the lowest position *to prevent falls and maintain the patient's safety.*[34]
- Discard used supplies in appropriate receptacles.[10]
- Reassess and respond to the patient's pain by evaluating the response to treatment and progress toward pain management goals. Assess for adverse reactions and risk factors for adverse events that may result from treatment.[28]
- Remove and discard your gloves and, if worn, other personal protective equipment.[10]
- Perform hand hygiene.[3][4][5][6][7][8]
- Document the procedure.[35][36][37][38]

Special Considerations

- Never use a cotton ball or cotton-filled gauze pad to clean a traumatic amputation wound *because cotton fibers left in the wound may cause contamination.*
- Monitor dressings for tightness, *because a tight dressing may be a sign of edema.* If edema is present, adjust the dressing *to avoid impaired circulation to the area.*
- Joint Commission issued a sentinel event alert concerning medical device alarm safety *because alarm-related events have been associated with permanent loss of function or death.* Among the major contributing factors were improper alarm settings, alarm settings turned off inappropriately, and alarm signals that were inaudible to staff. Make sure alarm limits are set appropriately and that alarms are turned on, functioning properly, and audible to staff. Follow facility guidelines for preventing alarm fatigue.[25]

Patient Teaching

Teach the patient and family (if appropriate) about pain management strategies during discharge planning. Include information about the patient’s pain management plan and adverse effects related to treatment.

Discuss activities of daily living and items in the home environment that might exacerbate pain or reduce the effectiveness of the pain management plan. Include strategies to address these issues. Teach about safe use, storage, and disposal of opioids, if prescribed.[28]

Complications

Complications associated with traumatic amputation wound care may include:

- disruption of tissue integrity
- local and systemic infection
- significant blood loss
- temporary increase in the patient's pain.[29]

Documentation

Documentation associated with traumatic amputation wound care includes:

- date and time of the procedure
- assessment of circulation, airway, and breathing
  - cardiopulmonary resuscitation initiated (if applicable)
- amount, type, and location of bleeding
  - control used (direct pressure, pressure points, tourniquet) and length of time applied
- wound description
- patient pertinent history
  - mechanism of injury and circumstances
  - tetanus immunization
  - allergies
  - factors that may complicate wound healing
- cardiac rhythm
- pulse oximetry readings
- supplemental oxygen administered
- IV insertion site and fluids administered
- pain assessment scores
  - interventions performed
  - response to those interventions
- medication administration
  - medication name
  - strength
  - dose
  - route of administration
  - date and time of administration
  - access site used (if applicable)
  - administration device used
  - rate of administration (if applicable)
- specific wound care measures
- laboratory results of blood studies
- care of the severed body part
- X-ray results
- preparation for surgery, if indicated
- teaching provided to the patient and family (if applicable)
  - understanding of that teaching
  - follow-up teaching needed.

Related Procedures

- Bite management, animal (Advanced practice)
- Bite management, human (Advanced practice)
- Bite management, insect (Advanced practice)
- Hydrotherapy for wound care
- Moist saline gauze dressing application
- Negative pressure wound therapy
- Negative pressure wound therapy, pediatric
- Postpartum infection care
- Traumatic abrasion wound care
- Traumatic abrasion wound care (Medical assistant)
- Traumatic abrasion wound care, ambulatory care

- Traumatic bite wound care (Medical assistant)
- Traumatic bite wound care, ambulatory care
- Traumatic laceration wound care
- Traumatic puncture wound care
- Traumatic puncture wound care, ambulatory care
- Traumatic simple laceration wound care (Medical assistant)
- Traumatic simple laceration wound care, ambulatory care
- Wound assessment, home care
- Wound care using maggots
- Wound care, gunshot
- Wound care, pediatric
- Wound dehiscence and evisceration management
- Wound pouching
- Wound stapling (Advanced practice)
- Wound suturing (Advanced practice)

Related UpToDate Patient Teaching Handouts

- Amputation
- Amputation – Discharge instructions
- Amputation of the foot or toe – Discharge instructions
- Amputation, below-the-knee – Discharge instructions
- How to care for an open wound
- Stump Wrapping
- Wound care – ED discharge instructions

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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 adapted from *Evidence-Based practice in nursing & healthcare: A guide to best practice,* Fifth edition, by Bernadette Mazurek Melnyk and Ellen Fineout-Overholt (2023).

Level I	Evidence from a systematic review or meta-analysis of all relevant randomized controlled trials (RCTs)
Level II	Evidence from well-designed single RCTs (experimental)
Level III	Evidence from well-designed nonrandomized controlled trials (quasi-experimental), systematic reviews of a complete body of evidence, and intervention studies using mixed methods
Level IV	Evidence from well-designed case-control and cohort studies (observational)
Level V	Evidence from systematic reviews of qualitative and descriptive studies
Level VI	Evidence from single descriptive and qualitative studies, evidence-based practice implementation, and quality improvement projects
Level VII	Evidence from expert opinion, expert committee reports, and literature reviews

Data from Gyatt, G., & Rennie D. (2002). Users' guides to the medical literature. American Medical Association; Harris, R. P., et al. (2001). Current methods of the U.S. Preventative Services Task Force: A review of the process. American Journal of Preventative Medicine, 20, 21-35.