FIGURE 7-19, A–C *The three classifications of burns are* **A,** *superficial burns,* **B,** *partial-thickness burns and* **C,** *full-thickness burns.* Courtesy of Alan Dimick, M.D., Professor of Surgery, Former Director of UAB Burn Center.

Burns are classified by their depth. The deeper the burn, the more severe it is. The three classifications of burns are as follows: superficial (sometimes referred to as first degree) (Fig. 7-19, A), partial thickness (sometimes referred to as second degree) (Fig. 7-19, B) and full thickness (sometimes referred to as third degree) (Fig. 7-19, C). Burns also are classified by their source: heat (thermal), chemical, electrical and radiation (such as from the sun).

A *critical burn* requires immediate medical attention. These burns are potentially life threatening, disfiguring and disabling. Unfortunately, it often is difficult to tell if a burn is critical. Even superficial burns can be critical if they affect a large area or certain body parts. You cannot judge a burn's severity by the person's level of pain because nerve endings may be destroyed.

Be aware that burns to a child or an infant could be caused by child abuse. Burns that are done intentionally to a child often leave an injury that cannot be hidden. One example is a sharp line dividing the burned and unburned skin such as from scalding water in a tub. If you think you have reasonable cause to believe that abuse has occurred, report your suspicions to the appropriate community or state agency. For more information on child abuse, see Chapter 9.

What to Look For

Signals of burns depend on whether the burn is superficial, partial thickness or full thickness.

- *Superficial burns*:
  - Involve only the top layer of skin.
  - Cause skin to become red and dry, usually painful and the area may swell.
  - Usually heal within a week without permanent scarring.
- *Partial-thickness burns*:
  - Involve the top layers of skin.
  - Cause skin to become red; usually painful; have blisters that may open and weep clear fluid, making the skin appear wet; may appear mottled; and often swells.
  - Usually heal in 3 to 4 weeks and may scar.
- *Full-thickness burns*:
  - May destroy all layers of skin and some or all of the underlying structures—fat, muscles, bones and nerves.
  - The skin may be brown or black (charred), with the tissue underneath sometimes appearing white, and can either be extremely painful or relatively painless (if the burn destroys nerve endings).
  - Healing may require medical assistance; scarring is likely.

When to Call 9-1-1

You should always call 9-1-1 or the local emergency number if the burned person has:

- Trouble breathing.
- Burns covering more than one body part or a large surface area.
- Suspected burns to the airway. Burns to the mouth and nose may be a sign of this.
- Burns to the head, neck, hands, feet or genitals.
- A full-thickness burn and is younger than 5 years or older than 60 years.
- A burn caused by chemicals, explosions or electricity.

What to Do Until Help Arrives

Care given for burns depends on the type of burn.

Heat (Thermal) Burns

Follow these basic steps when caring for a *heat* burn:

- Check the scene for safety.
- Stop the burning by removing the person from the source of the burn.
- Check for life-threatening conditions.

- As soon as possible, cool the burn with large amounts of cold running water, at least until pain is relieved (Fig. 7-20, A).
- Cover the burn loosely with a sterile dressing (Fig. 7-20, B).
- Take steps to minimize shock. Keep the person from getting chilled or overheated.
- Comfort and reassure the person.
- *Do not* apply ice or ice water to any burn. Ice and ice water can cause the body to lose heat rapidly and further damages body tissues.
- *Do not* touch a burn with anything except a clean covering.
- *Do not* remove pieces of clothing that stick to the burned area.
- *Do not* try to clean a severe burn.
- *Do not* break blisters.
- *Do not* use any kind of ointment on a severe burn.

When a person suffers a burn, he or she is less able to regulate body temperature. As a result, a person who has been burned tends to become chilled. To help maintain body temperature and prevent hypothermia, keep the person warm and away from drafts. Remember that cooling a burn over a large area of the body can bring on hypothermia. Be aware of this risk and look for signals of hypothermia. If possible, monitor the person's core body temperature when cooling a burn that covers a large area.

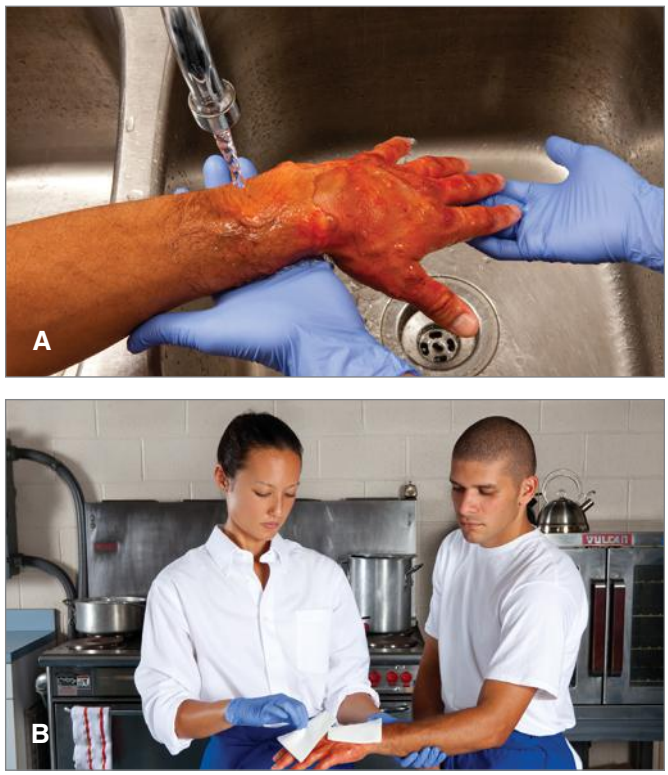

FIGURE 7-20 A–B **A,** *Cool a thermal burn with large amounts of cold running water until the pain is relieved.* **B,** *Cover a thermal burn loosely with a sterile dressing.*

Chemical Burns

When caring for *chemical burns* it is important to remember that the chemical will continue to burn as long as it is on the skin. You must remove the chemical from the skin as quickly as possible. To do so, follow these steps:

- If the burn was caused by dry chemicals, brush off the chemicals using gloved hands or a towel and remove any contaminated clothing before flushing with tap water (under pressure). Be careful not to get the chemical on yourself or on a different area of the person's skin.
- Flush the burn with large amounts of cool running water. Continue flushing the burn for at least 20 minutes or until EMS personnel take over.
- If an eye is burned by a chemical, flush the affected eye with water until EMS personnel take over. Tilt the head so that the affected eye is lower than the unaffected eye as you flush (Fig. 7-21).
- If possible, have the person remove contaminated clothes to prevent further contamination while you continue to flush the area.

Be aware that chemicals can be inhaled, potentially damaging the airway or lungs.

Electrical Burns

If you encounter a person with an *electrical burn*, you should:

- Never go near the person until you are sure he or she is not still in contact with the power source.
- Turn off the power at its source and care for any life-threatening conditions.
- Call 9-1-1 or the local emergency number. Any person who has suffered an electrical shock needs to be evaluated by a medical professional to determine the extent of injury.

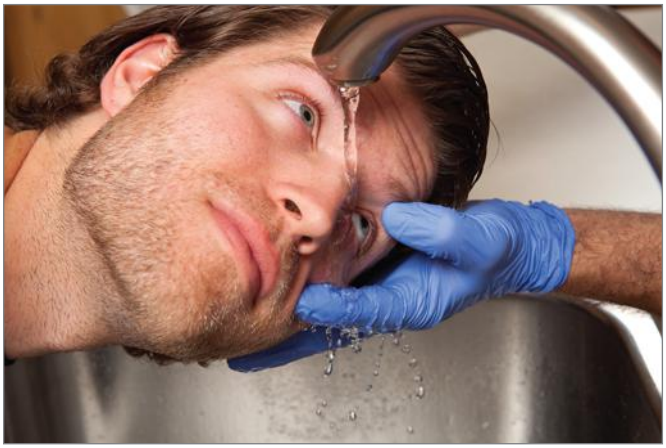

FIGURE 7-21 *If an eye is burned by a chemical, flush the affected eye with water until EMS personnel take over.*

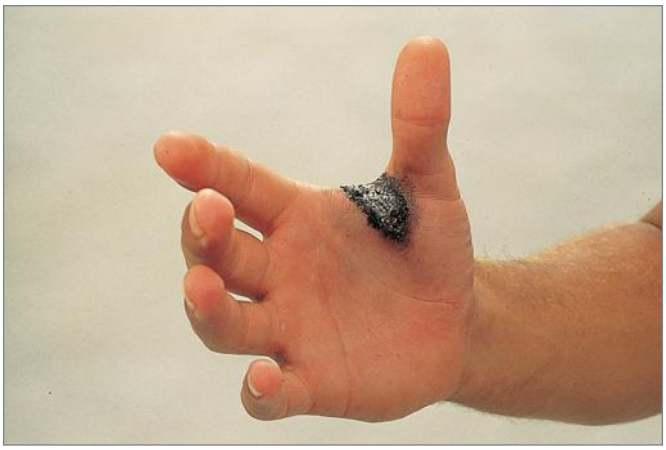

FIGURE 7-22 *For an electrical burn, look for entry and exit wounds and give the appropriate care.*

- Be aware that electrocution can cause cardiac and respiratory emergencies. Therefore, be prepared to perform CPR or use an automated external defibrillator (AED).
- Care for shock and thermal burns.
- Look for entry and exit wounds and give the appropriate care (Fig. 7-22).
- Remember that anyone suffering from electric shock requires advanced medical care.

Radiation Burns

Care for a *radiation (sun) burn* as you would for any thermal burn (Fig. 7-23). Always cool the burn and protect the area from further damage by keeping the person away from the source of the burn.

Preventing Burns

- Heat burns can be prevented by following safety practices that prevent fire and by being careful around sources of heat.
- Chemical burns can be prevented by following safety practices around all chemicals and by following manufacturers' guidelines when handling chemicals.
- Electrical burns can be prevented by following safety practices around electrical lines and equipment and by leaving outdoor areas when lightning could strike.
- Sunburn can be prevented by wearing appropriate clothing and using sunscreen. Sunscreen should have a sun protection factor (SPF) of at least 15.

SPECIAL SITUATIONS

Certain types of wounds need special attention or care. These types of situations include crush injury; severed body parts (amputations); impaled objects; and injury to the mouth, nose, lip, tooth, chest and abdomen.

Crush Injuries

A crush injury is caused by strong pressure against a body part, often a limb. It may result in serious damage to underlying tissue, causing bruising, bleeding, lacerations, fractures, shock and internal injuries. Call 9-1-1 or the local emergency number for any serious or life-threatening condition. Care for specific injuries found and assume that internal injuries are present. Also care for shock.

Severed Body Parts

If part of the body has been torn or cut off, call 9-1-1 or the local emergency number, then try to find the part and wrap it in sterile gauze or any clean material, such as a washcloth. Put the wrapped part in a plastic bag and seal the bag. Keep the part cold and bag cool by placing it in a larger bag or container of an ice and water slurry, *not* on ice alone and *not* on dry ice, if possible, but do not freeze (Fig. 7-24). Be sure the part is taken to the hospital with the person. Doctors may be able to reattach it.

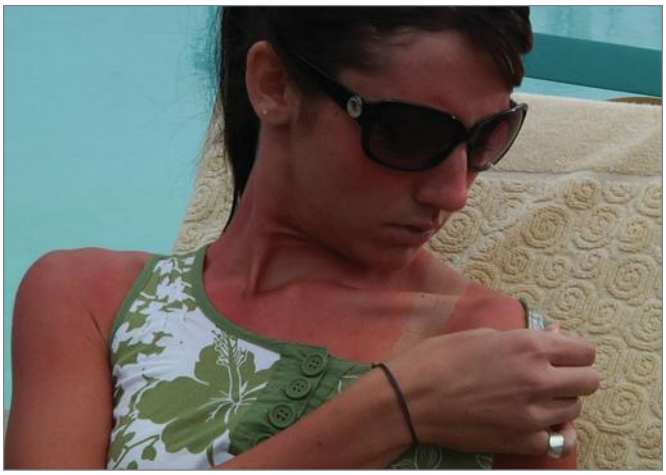

FIGURE 7-23 *Care for sunburn as you would for any thermal burn.*

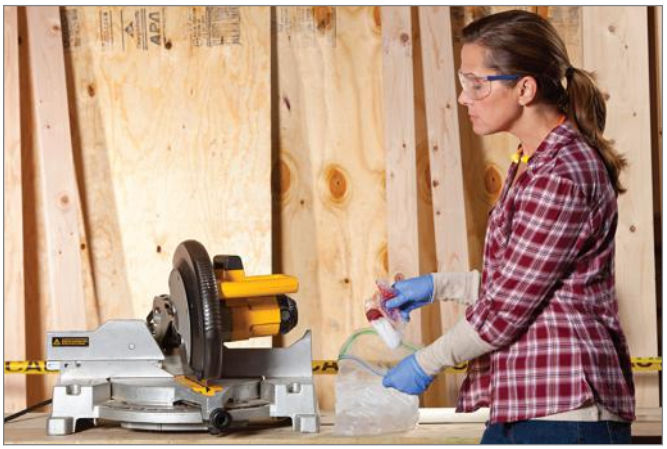

FIGURE 7-24 *Wrap a severed body part in sterile gauze, put it in a plastic bag and put the bag on ice.*