SKIN ANATOMY
The skin is comprised of 3 layers that can be injured by a burn:
- **The epidermis**, or outer layer, acts as a barrier against infection and moisture loss.
- **The dermis**, or middle layer, provides elasticity and protection against trauma. It also contains the blood vessels that supply all the skin layers.
- **The subcutaneous tissue**, the deepest layer, consists of fat, connective tissue, larger blood vessels, and nerves. This layer is important for temperature regulation and acts as a “shock absorber” against injury.

BURN CLASSIFICATION
Burns are classified according to their size, location, and depth. The previous classification based on the depth of the burn (first, second, third, or fourth degree) is being replaced by a system that helps identify burns that require surgical treatment.

- **Superficial burns** (formerly known as “first degree”) involve only the epidermis or outer skin.
  - They are red, painful, dry, and blanch to the touch (eg. a non-blistering sunburn).
  - They usually heal in 5-10 days without scarring.

- **Superficial partial-thickness burns** (“superficial second degree”) involve all of the epidermis and part of the underlying dermis, which includes blood vessels that supply the skin.
  - These burns usually form blisters and are characterized by painful, red weepy skin that blanches with pressure.
  - They usually heal within 2 weeks. Scarring is not typical, though changes in skin color may be permanent.

- **Deep partial-thickness burns** (“deep second degree”) involve the deeper layers of the dermis, including hair follicles and glandular tissue.
  - These burns are patchy white to red in color. They almost always blister, may be wet or waxy dry, and do not blanch with pressure.
  - They are painful to deep pressure only.
  - Healing takes 3 weeks or more. Scarring is common and may be severe.

- **Full-thickness burns** (“third degree”) involve all 3 skin layers, including the subcutaneous fat.
  - These burns are white, brown, grey, or black and do not blanch with pressure. The skin is dry, and waxy or leathery in texture. Blisters are not present.
  - These wounds are not painful to the touch because the injured skin cannot feel anything except for deep pressure.
  - Surgical treatment (eg. a skin graft) is required for healing. Scarring is usually severe.

- **Fourth degree burns** destroy all skin layers and extend into muscle, tendon, or bone.

WHEN TO SEEK URGENT MEDICAL CARE
Most skin burns are minor and can be managed at home. However, moderate to severe burns can result in serious complications. It is important to seek urgent medical treatment if you have any of the following:
- A burn on your face, neck, hands, feet, or genitals.
- A burn on or near a major joint.
- A burn that encircles a body part (chest, arm, finger, leg, foot).
- A large burn (greater than 3 inches).
- A deep burn (deep partial-thickness or full thickness).
- Burns associated with another injury, such as a broken bone.
- An electrical burn (due to the risk of internal organ damage).
- Signs of a skin infection (worsening pain, redness, fever, pus-like drainage).
BURN TREATMENT

■ What To Do At Home For a Minor Burn

Minor burns (like small superficial or superficial partial-thickness burns) can often be treated at home.

- Remove any clothing from the burned area. If clothing sticks to the skin, leave it alone and seek medical care.
- Place the burned area under cool tap water for 5-20 minutes. Do not use ice water or an ice pack, which can lead to further injury.
- Clean the site gently with mild soap and water. Avoid scrubbing or using harsh soaps or cleansers, like alcohol or iodine.
- Do not open or pop any blisters on your own.
- Cover the burn with an antibiotic cream (like Polysporin or Bacitracin) and a gauze bandage.
- Take acetaminophen (Tylenol), ibuprofen (Advil or Motrin), or naproxen (Aleve) as needed for pain. Take ibuprofen or naproxen with food to avoid an upset stomach.

■ Care of Blisters

- Due to the risk of infection, do not open or pop any blisters on your own. Most blisters will open and drain on their own.
- Small blisters (less than 6mm) should be left intact. They are sometimes called “nature’s bandaids” because they may act as a barrier against infection.
- Large blisters and blisters that cross a joint or prevent joint movement should be opened and debrided by a medical professional.

■ Antimicrobial Creams

- Superficial burns and superficial partial thickness burns with intact skin do not require antimicrobial agents. These burns can be treated with lotion, plain petroleum jelly (Vaseline), aloe vera, or honey.
- Burns that are partial thickness with non-intact skin should be treated with an antimicrobial agent to prevent infection. Common examples include Polysporin, Bacitracin, and Silvadene (silver sulfadiazine).
  - Polysporin and Bacitracin are available over-the-counter and are safe on the face and genital areas.
  - Silvadene is available by prescription only and often recommended for partial thickness burns. Avoid Silvadene if you are allergic to sulfa medications, have a G6PD deficiency, or are pregnant/breastfeeding. Silvadene should not be used in infants less than 2 months old.

■ Bandages

To promote healing, burn wounds should be kept moist but not wet. Covering the burn site with a bandage helps to maintain moisture and protect against infection and further injury.

- For minor burns with intact skin, a bandage is optional.
- Open blisters or raw skin need to be covered with a clean bandage until the wound is healing and no longer leaking fluid. Use a non-stick bandage for the first layer, and cover with a gauze dressing.
- Change the bandage 1-2 times a day and whenever it is wet or dirty.
  - Wash the area gently with mild soap and water. You can lightly moisten the bandage with water if it is sticking to the burn.
  - Reapply the antibiotic cream (be sure the old cream has been removed). It is best to stop Silvadene use once new skin starts to appear.

■ Other

- If it has been more than 5 years since your last tetanus vaccination, a booster is recommended for all patients with more than a superficial (first degree) burn.
- Use a non-perfumed moisturizing cream once new skin has formed. Examples include Vaseline Intensive Care, Eucerin, Nivea, mineral oil, and cocoa butter. Avoid lotions containing lanolin (eg. Aquaphor Healing Ointment), as well as thick ointments, since they may be irritating to the skin.
- If itching is bothersome as the burn heals, an over-the-counter antihistamine like cetirizine (Zyrtec) or diphenhydramine (Benadryl) is effective. Moisturizers listed above can also help. Avoid scratching!
- Watch for signs of infection. A small degree of redness at the edge of the wound or some clear yellowish drainage is normal. Notify your medical provider immediately if there is increased redness, warmth, swelling, pain, pus-like drainage, or fever.
- Use sunscreen regularly once the skin has healed to prevent sunburn and changes in skin pigmentation.
- A scar reduction ointment, like over-the-counter Mederma, may be used once the burn has fully healed. Studies have not proven the effectiveness of this product.