

Burns

A plain-English guide for you and your family

WHAT IS HAPPENING

Your skin is a living wrapper that keeps germs out, holds water in, and controls your body temperature. When a burn happens—from fire, boiling water, electricity, harsh chemicals, or even radiation—the heat or injury kills skin cells on contact. The deeper the burn, the more layers are destroyed. Once that protective barrier breaks, your body loses fluid fast because the tiny blood vessels underneath start leaking like cracked pipes. Swelling builds up in the burned area and sometimes all over your body. If smoke gets into your lungs, the airway can swell shut hours later, even if breathing seemed fine at first. Electrical burns are especially tricky because the current travels deep inside, damaging muscles and the heart in ways you can't see on the skin. The body tries to fight back by sending extra blood and fluid to the injury, but that can leave the rest of the body short on fluid, leading to shock. Pain is intense because nerve endings are exposed or irritated. The open wound is also a wide-open door for bacteria, so infection is a constant risk. Every strange finding—blisters, dark leathery skin, low blood pressure, little or no urine, fast heart rate, tight swollen limbs—traces back to that one upstream break: the skin barrier is gone, and the body is scrambling to survive while it tries to heal.

What you might feel

- Red, warm skin that hurts when you touch it (first-degree burn)
- Blisters with clear or yellow fluid, very painful, weeping surface (second-degree / partial-thickness burn)
- White, brown, or black leathery skin that does not hurt (third-degree / full-thickness burn)
- Burned area covers a large part of the body (measured by percentage of total body surface area, or TBSA)
- Burn goes all the way around an arm, leg, chest, or neck (circumferential burn)
- Soot or burned hairs inside the nose or mouth, hoarse voice, or coughing up black mucus
- Burn on the face, hands, feet, groin, or over a joint
- Burn from electricity (entry and exit wounds, muscle pain, dark urine)

Call the doctor right away if...

- Burns covering more than 10% of the body in an adult or more than 5% in a child (high risk of shock and organ failure)
- Any burn that goes all the way around an arm, leg, chest, or neck (can cut off blood flow or breathing)
- Burn on the face, airway signs (soot in nose, hoarse voice, trouble breathing), or suspected smoke inhalation (airway can swell shut)
- Electrical or chemical burns (hidden deep-tissue damage or ongoing chemical injury)
- Burns in very young children, older adults, or people with other serious medical problems like diabetes or heart disease (higher risk of complications)

What the care team will do

- Check airway every 15 to 30 minutes for the first 24 hours: listen for a high-pitched noise on breathing in (stridor) (high-pitched squeaky breathing), hoarseness, drooling, or increased work of breathing; keep intubation equipment and the rapid response team immediately available.
- Start two large-bore IV lines (18-gauge or bigger) in unburned skin if the burn covers more than 20% of body surface, and give warmed Lactated Ringer solution using the Parkland formula: 4 milliliters times body weight in kilograms times percent body surface burned, with half given in the first 8 hours from time of injury.
- Measure urine output every hour with a Foley catheter and adjust IV fluid rate to keep urine output between 30 and 50 milliliters per hour in adults or 1 milliliter per kilogram per hour in children.
- Assess circulation in burned arms and legs every 1 to 2 hours: check pulses with Doppler ultrasound, capillary refill (press the nail and watch color return), skin temperature, sensation, and pain with passive stretch of fingers or toes; notify the provider immediately if pulses weaken or disappear.
- Monitor core body temperature continuously and keep the patient warm with warmed blankets, warmed IV fluids, and increased room temperature to at least 80 degrees Fahrenheit.
- Cover burns loosely with clean, dry sheets (not wet dressings) until the provider examines them; do not apply ice, butter, ointments, or break blisters.
- Place the patient on continuous cardiac telemetry (heart monitor) for any electrical burn or burn larger than 20% of body surface; watch for and immediately report ST-segment changes, arrhythmias, or elevated troponin (a heart enzyme that shows muscle damage).

- Give IV opioid pain medication (morphine or fentanyl) every 1 to 2 hours as needed, assess pain score before and after each dose, and never give pain medications by mouth or intramuscular injection.

Medicines you may be given — and why

Lactated Ringer's (LR) intravenous fluid

When skin burns, tiny blood vessels leak fluid out of the bloodstream into the tissue (like water soaking into a sponge). This makes blood pressure drop and organs can't get enough blood. Lactated Ringer's is salt water that closely matches the fluid inside your body. We give it through a vein to refill the blood vessels so blood pressure comes back up and organs (kidneys, brain, heart) get the blood and oxygen they need.

Morphine or fentanyl (intravenous opioids)

Burn pain is severe because nerve endings in the skin are exposed and firing constantly. Opioids attach to receptors (like locks) in the brain and spinal cord that control pain signals. When the opioid locks onto the receptor, it turns down the volume on pain messages traveling from the burn to the brain, so the person feels much less pain.

Silver sulfadiazine 1% cream (topical)

Burned skin loses its protective barrier, so bacteria on the skin surface or in the air can invade the wound and cause infection. Silver sulfadiazine releases silver ions (tiny charged particles) that get inside bacteria and damage their DNA and cell walls, killing them before they can multiply and cause infection. The cream also keeps the wound moist, which helps healing.

Tetanus toxoid vaccine (Tdap or Td booster)

Tetanus bacteria live in soil and dust. When skin is broken (by a burn, cut, or puncture), the bacteria can get into the wound and release a toxin (poison) that locks up muscles, including the jaw and throat, making it impossible to breathe. The tetanus vaccine teaches your immune system to recognize and destroy the toxin before it can cause disease. If you haven't had a booster in 5-10 years, a burn wound is a time to get one.

Mafenide acetate 11.2% cream (topical, alternative antimicrobial)

Like silver sulfadiazine, mafenide kills bacteria in burn wounds. The advantage is that mafenide soaks deeper into burned tissue (including cartilage, like ears and nose), reaching bacteria that surface creams miss. It works by blocking an enzyme (carbonic anhydrase) inside bacteria that they need to grow, and it also acts like other sulfa drugs to stop bacteria from making folic acid (a vitamin they need to copy DNA). Without folic acid, bacteria cannot multiply.

Bacitracin or polysporin ointment (topical, for superficial burns)

For small, shallow burns (like minor kitchen burns), bacitracin keeps the wound moist and kills common skin bacteria (Staphylococcus, Streptococcus). Bacitracin blocks bacteria from building their cell wall—without a strong wall, the bacteria burst and die. Keeping the wound moist under ointment also speeds healing and reduces scarring.

Where this information comes from

- American Burn Association (ABA) 2023 guidelines
- Advanced Burn Life Support (ABLS) course
- CDC injury prevention resources
- WHO emergency care guidelines

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