CONDITION

Burns

Learn how burns affect the skin, how burn depth and size are assessed, what first aid can help, and when urgent or emergency care is needed.

WHAT IT IS
Injury caused by heat, chemicals, electricity, radiation, or friction

BODY SYSTEM
Skin

MAIN SYMPTOMS
Redness, pain, swelling, blisters

WHAT CAUSES IT
Heat, chemicals, electricity, radiation, or friction

HOW IT IS DIAGNOSED
Clinical assessment of depth, size, location, and cause

MAIN TREATMENT
First aid and wound care

CAN IT BE CURED?
Sometimes - superficial burns often heal

IS IT AN EMERGENCY?
Sometimes - trouble breathing after smoke exposure

LONG-TERM OUTLOOK
Healing for small superficial burns but possible scarring and contractures after deep burns

Overview

A burn is an injury caused by heat, chemicals, electricity, radiation, or friction. Burns most often damage the skin, but severe burns can also affect fat, muscle, nerves, blood vessels, and internal organs.

Skin helps control body temperature, prevent fluid loss, and protect against infection. A burn can interfere with these functions. How much it matters depends on the burn's depth, size, location, cause, and the person's age and overall health.

Burns are often described by depth:

The older terms "first-degree," "second-degree," and "third-degree" are still used, but descriptions based on skin depth are usually more informative.

Small, superficial burns often heal with basic first aid. Deep, large, electrical, chemical, or smoke-related burns may need prompt specialist care. A burn can become deeper during the first few days, so its early appearance does not always show the final severity.

- Superficial burns affect only the outer skin layer. The skin is red, dry, tender, and usually does not blister.
- Partial-thickness burns extend into the deeper skin layer. They may be moist, very painful, swollen, or blistered. Deeper partial-thickness burns can look pale or mottled and may be less sensitive.
- Full-thickness burns destroy the full thickness of the skin. The area may look white, brown, black, dry, or leathery. It can be numb because nerve endings have been damaged.

Symptoms

Symptoms depend on the cause and depth of the injury. They may include:

Pain does not reliably show how serious a burn is. Superficial and partial-thickness burns can be very painful, while a full-thickness burn may cause little pain in its center because nerves have been destroyed. Areas around a deep burn may still hurt.

Signs that may suggest a developing wound infection include increasing redness or swelling around the burn, worsening pain after initial improvement, pus-like drainage, an unpleasant smell, fever, or red streaks extending from the wound. Fever soon after a major burn can have several causes, so a clinician must assess it in context.

Smoke inhalation can injure the throat and lungs even when there is little visible skin damage. Symptoms may be delayed. Facial burns, soot around the mouth or nose, singed nasal hair, or exposure in an enclosed space increase concern, but their absence does not rule out inhalation injury.

- Redness, warmth, tenderness, or swelling
- Pain, stinging, or throbbing
- Blisters that contain clear or cloudy fluid
- Wet, shiny, pale, mottled, waxy, or leathery skin
- White, brown, charred, or blackened areas
- Reduced feeling or numbness in a deep burn
- Limited movement when a burn crosses a joint

- Cough, hoarseness, wheezing, headache, confusion, or shortness of breath after smoke exposure

Causes and risk factors

Common causes include contact with flames, hot liquids or steam, hot surfaces, and cooking oils. Other causes include friction, strong acids or alkalis, household or industrial chemicals, electrical current, lightning, sunlight, radiation treatment, and prolonged contact with very cold material.

Some circumstances increase the chance of a serious injury:

Electrical burns can cause deep damage along the path of the current, even when the skin marks look small. They may also affect heart rhythm or cause falls. Chemical burns can continue to damage tissue until the substance is removed. Some chemicals require specific handling, so contacting emergency services or a poison control center is important.

- Young children and older adults have thinner skin and may be injured more deeply by the same heat exposure.
- Reduced mobility, reduced sensation, or difficulty reacting quickly can prolong contact with the source.
- Diabetes, nerve damage, poor circulation, or immune system problems may affect healing.
- Smoking, oxygen equipment, damaged electrical wiring, and unsafe heating or cooking practices increase fire risk.
- Alcohol or sedating substances can slow escape from a fire or response to an injury.
- Workplace exposure may involve high-voltage electricity, hot materials, or concentrated chemicals.

Diagnosis

A clinician assesses the burn's cause, depth, size, location, and time of injury. They will also ask about smoke exposure, other injuries, health conditions, medicines, allergies, and tetanus vaccination history.

Burn size is estimated as a percentage of total body surface area , meaning the proportion of the body covered by partial-thickness or full-thickness burns. Clinicians may use body charts or standardized methods. The person's whole hand, including the fingers, is roughly 1% of body surface area and can help estimate scattered small burns, but home estimates may be

inaccurate.

Location also matters. Burns involving the face, hands, feet, genitals, area between the genitals and anus, or major joints may threaten breathing, movement, or important functions. A burn that circles a limb or the chest can become tight as swelling develops and may restrict blood flow or breathing.

Small burns usually do not require testing. For a major, electrical, or smoke-related burn, evaluation may include blood tests, heart monitoring, a chest X-ray, or tests for carbon monoxide exposure. A camera examination of the airway may be needed if inhalation injury is suspected.

Burn depth can change or become clearer over time. Clinicians may reassess the wound after cleaning it and again during follow-up.

Treatment and management

Immediate first aid

First move away from the source without putting yourself at risk. Extinguish flames or stop contact with the hot object. Turn off electrical power before approaching someone in contact with a live current.

Remove rings, watches, belts, diapers, and loose clothing near the burn before swelling develops. Do not pull away anything stuck to the skin.

For a recent thermal burn, cool the area under cool or lukewarm running water for about 20 minutes. Begin as soon as practical. Do not use ice or very cold water, which can further damage tissue and lower body temperature. Keep the rest of the person warm, especially with a large burn or in a young child.

Do not apply butter, grease, toothpaste, powders, or unapproved home remedies. These can trap heat, irritate the wound, or make cleaning more difficult.

After cooling, loosely cover the area with a clean, nonstick dressing. Clean plastic wrap may be used temporarily over a limb or flat area, but it should not be wrapped tightly or placed over the face. Raise a burned arm or leg if practical to limit swelling.

For a dry chemical, avoid direct contact and carefully brush off visible powder before irrigation. Remove contaminated clothing. Flush most chemical burns with plenty of running water, but because some chemicals react with water, obtain immediate instructions from emergency services, workplace safety staff, or a poison control center.

When emergency care is needed

Call emergency services for trouble breathing, confusion, fainting, severe weakness, or suspected smoke or toxic-fume inhalation. Emergency evaluation is also appropriate for large or deep burns, burns from high-voltage electricity or lightning, and serious chemical burns.

Prompt specialist assessment is important for:

The American Burn Association provides referral criteria to help clinicians decide when consultation with or transfer to a burn center is appropriate.

Medical treatment

A clinician may gently clean the burn and remove loose dead tissue. Blister care depends on blister size, location, and the chance of rupture. Do not intentionally break blisters unless a healthcare professional recommends it.

Dressings protect the wound, absorb drainage, and support healing. The choice depends on burn depth and location. Some dressings can remain in place for several days; others need more frequent changes. A clinician may use a topical antimicrobial product when appropriate. Preventive antibiotic tablets or injections are not routinely used for uncomplicated outpatient burns.

Nonprescription pain relievers may help with minor burns when used according to the label and when they are safe for the person. More serious burns may require prescription pain treatment, especially during dressing changes. Treatment should be individualized by a healthcare professional.

Burns are considered wounds that may carry a tetanus risk. A clinician may recommend a tetanus-containing vaccine based on the wound and vaccination history. Tetanus immune globulin may be needed for some people with incomplete or unknown vaccination.

Major burns may require oxygen, intravenous fluids, temperature support, intensive wound care, and nutrition therapy. Deep burns may need surgery to remove dead tissue and cover the area with a skin graft. Physical or occupational therapy helps preserve strength and movement.

- Full-thickness burns
- Partial-thickness burns covering a large area
- Deep burns of the face, hands, feet, genitals, perineum, or major joints
- Burns that circle a limb, finger, toe, neck, or chest
- Electrical or chemical injuries
- Burns with major trauma or significant medical conditions
- Burns in children when local resources are not equipped for pediatric care

Complications

Possible complications include infection, fluid loss, low body temperature, and scarring. Major burns can lead to shock, kidney problems, lung injury, or a body-wide response that affects several organs.

A tight layer of burned tissue, called an eschar , can reduce circulation when it surrounds a swollen limb. It can also restrict breathing when it circles the chest. A surgical release may be needed in severe cases.

Deep burns and burns across joints may heal with thick, raised scars. A contracture is scar tightening that limits movement. Early positioning, exercises, splints, pressure treatments, or reconstructive procedures may reduce long-term problems.

Burn injuries can also affect sleep, mood, body image, work, and relationships. Psychological support and burn rehabilitation can be important parts of recovery, particularly after a visible or life-changing injury.

Follow up

Keep scheduled wound checks even if pain is improving. Follow-up allows the care team to reassess burn depth, check healing, change the dressing plan, and monitor movement and scarring.

Follow the instructions provided for bathing and dressing changes. Keep dressings clean and dry unless told otherwise. Do not use adhesive material directly on burned skin. Once the wound has fully closed, the new skin may remain sensitive, dry, itchy, and more likely to burn in sunlight. Ask the care team about moisturizers and sun protection.

Contact a healthcare professional promptly if the wound becomes more painful, red, swollen, warm, or foul-smelling; develops pus-like drainage; reopens; or is not healing as expected. New fever, reduced movement, numbness, or color changes in fingers or toes also need timely assessment.

Seek emergency help for breathing difficulty, worsening hoarseness, confusion, fainting, blue or gray lips, severe weakness, or rapidly increasing swelling after a burn. These symptoms are different from concerns that can wait for routine follow-up.

Sources



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