

Burns

Burns have a number of causes, including thermal agents, ultraviolet light radiation, chemicals, and electricity. Burn damage in the skin causes cellular death, capillary injury, and coagulation of protein. Capillary injury is manifested by increased capillary permeability, resulting in a wet or weepy appearance of second and third degree burns.

About two million burns occur yearly in the United States.(1 &#n109766>) Fully 500,000 are seen in the emergency room, 100,000 result in hospitalization, and 20,000 are of sufficient severity to necessitate care in a burn center.(2 &#n109767>) Burns are the fourth most frequent cause of death from unintentional injury. Over 80 percent of minor burns occur in the home, usually being caused by scalds, contact burns, and fabric burns.(3 &#n112186>) Most of these burns do not require medical assistance, and may be managed by the patient with appropriate care and nonprescription products.

Of the minor burns that occur outside the home, sunburn is the most common. Sunburn has been underrated in most burn surveys because the public does not consider sunburn in the same context as thermal burns.(4 &#n109768>) Sunburn is different from thermal burns in that it does not result from an abrupt temperature increase in tissue, but rather is produced gradually from the ionizing radiation of the sun or other ultraviolet light source. It is also the only burn that is considered preventable and generally results from a willful choice of prolonged exposure to sunlight.

Thermal burns can be caused by flames, flaming liquids such as food or drinks made with high-proof alcohol and set afire, hot liquids such as water or oil, hot objects such as curling irons, burners, irons, and even hot pavement, and hot gasses such as steam burns, or gasses released during airbag deployment.

Scalds represent about 30 percent of burn injuries and generally occur from common household accidents. Sources include boiling water, hot coffee, soup, or other hot beverages, and even hot water from a faucet. Because a child?s skin is much thinner than an adult?s, it is easy to cause scalding even in hot tub water. For this reason, it is recommended that all hot water heaters be adjusted to no more than 120-130°F.

Chemical burns result from exposure to caustic chemicals such as acids and alkalis. Battery acid, hydrochloric acid, and sulfuric acid are a few examples, as well as drain cleaners, caustic lime, oven cleaners, and cement. Chemical burns can also result from garlic applied to the skin as a natural remedy.(5 &#n109769>)

Electrical burns usually result from touching a source of electricity. In the pediatric population, this can occur when children bite through cords or place objects into outlets. In evaluating electrical burns, both the entrance and exit site must be evaluated.

Electrical burns are usually considered quite serious, and depending upon the voltage exposure, may cause full thickness injuries affecting muscle and even bone. Complications from electrical burns include bone and soft tissue destruction, renal tubular damage, cardiac dysrhythmias, and cardiovascular collapse.

Burns have long been classified in degrees. This classification system is used to describe all types of burns, whether thermal, electrical, chemical, or sunburn and progresses from the least severe (first degree) to the most severe (fourth degree).

Burn assessment is difficult, even for professionals. The American Burn Association has developed an injury severity grading system:

Minor burns generally may be treated on an outpatient basis. Very young patients may need hospitalization.

1. Less than 15 percent of the body surface area (BSA) in adults or 10 percent in children and the elderly if a partial thickness burn;
2. Less than 2 percent of the BSA is a full thickness burn;
3. Must not present functional or cosmetic risk to areas of specialized function (face, eyes, ears, hands, feet, and perineum).

Moderate burns may be treated in the hospital; they do not require treatment in a burn facility.

- * 15-25 percent body surface area in adults or 10-20 percent in children and elderly if a partial-thickness burn;
- * 2-10 percent of the BSA if a full thickness burn;
- * Must not present functional or cosmetic risk to areas of specialized function.

Major burns require emergency treatment at a local hospital followed by transport to a regional burn facility for specialized definitive care.

- * More than 25 percent of the BSA in adults and more than 20 percent in children and the elderly if a partial thickness burn;
- * More than 10 percent of BSA if a full thickness burn;
- * All burns involving the face, eyes, ears, hands, feet, or perineum that may result in functional or cosmetic impairment;
- * Burns due to caustic chemical agents;
- * High voltage electrical injury;
- * Burns complicated by inhalation injury, major trauma, or poor risk patients.

Infection secondary to burns can be dangerous and difficult to treat because the burned skin provides an excellent growth medium for bacteria. Also, the burned tissue hampers the effective delivery of systemic antibiotics.

Additional complications may occur if the patient has another medical condition that compromises healing, causes reduced circulation, or a decreased ability to resist infection.

The risk of complications increases as the severity of the burn increases. The more deeply the skin layers are damaged, the greater the body's natural defense mechanisms are compromised, increasing the possibilities of skin infection, systemic infection, fluid and electrolyte loss, and shock, which can cause death.

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¹ Parsons L. Office management of minor burns. *Lipencotts Primary Care Practice*. 1997;1(40):1997.

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² Griglak MJ. Thermal injury. *Emerg Med Clin North Am*. 1992;10:369.

[View Abstract view-abs.asp?fnid=109767&absid=102370>](#)

³ U.S. Preventive Services Task Force, *Guidelines from Guide to Clinical Preventive Services. Second Edition*. Williams & Wilkins; 1996.

⁴ Bond CA. Burn and sunburn products. *Handbook of Nonprescription Drugs, 9th ed*. Washington, DC: APhA; 1990:889-902.

⁵ Farrell AM, Staughton RCD. Garlic burns mimicking herpes zoster. *Lancet*. 1996;347:1195.

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