

# Burns

## Preventing and Managing Skin Injuries

Wounds Canada has developed this simple guide that can be used by patients and their care partners for preventing or caring for burns at home.

Each year thousands of Canadians sustain a burn injury. Over 95% of these injuries are minor (only affecting the top layers of skin) and rarely require hospitalization. Most non-complicated, minor burn injuries will heal on their own with simple treatment. The two most common causes of burn injuries are:

- **Scalds:** hot beverages and hot water
- **Contact burns:** stoves/ovens and fireplaces/accessories



### What is a burn injury?

Burns are injuries that occur when the skin or other tissues are damaged by contact with heat (scalds from liquids, grease or steam; contact burns; and fire, flash or flame), extreme cold, electricity, radiation or chemicals. The damage can vary from reddened skin (superficial) to blistering (partial-thickness) to deep damage (full-thickness) and depends on the:

- temperature of the burning agent
- amount of time the skin was exposed to the burning agent
- type and location of the skin or tissues involved
- extent and depth of skin surface/tissue injured
- age of the person
- pre-burn medical history
- circumstances or complicating factors such as smoke inhalation and other traumatic injuries

### Types and Causes of Burn Injuries

#### Thermal Burns

Heat-related burn injuries have a range of causes and vary in depth and size.

- **Flame injuries** are caused by direct contact with fire, and **flash injuries** are the result of an explosion. Injury can occur at various depths and cover varied amounts of skin.
- **Scalds** are caused by contact with something wet and hot, such as hot water or steam. The damage tends to be shallow and may involve a large area of skin. Scalds from thicker liquids like oil, grease, liquid glue or liquid wax that are splashed on a person's skin tend to cause more severe burn injuries than those from thinner liquids, like hot tap water. Thicker fluids tend to roll off a person's skin at a slower rate and cling to the skin, increasing the amount of time they are on the skin. When the skin is immersed in hot liquid it can be severely damaged due to the increased time of contact between the heat agent and the skin. Such burns can cover a larger skin area.
- **Contact burns** are caused by prolonged transfer of heat from an object to the skin. They tend to cause deep tissue damage and generally involve less skin area.
- **Cold-related burns**, also known as frostbite, can result from contact with super-cooled objects such as ice packs or from exposure to cold air (made worse if it is windy) or cold water.

**Disclaimer:** The content in this resource is for informational purposes only and is NOT a substitute for professional medical advice, diagnosis or treatment. You should always consult with your health-care professional before starting any new treatment or changing or stopping an existing treatment.

## Electrical Burns

Electrical burns are the result of electrical currents passing through the body. Temporary or permanent damage can occur to the skin, tissues and major organs. The extent of the damage depends on the strength (voltage, wattage and amperage) and duration of the electrical current. Electrical burns result from contact with exposed parts of electrical appliances, wiring or lightning strikes.

Appliance or wiring injuries may occur when:

- children bite on electrical cords
- utensils or other metal objects are poked into electrical outlets, or appliances such as a plugged-in toaster
- the power supply is not shut down before making home repairs or installation of lighting, for example
- a plugged-in appliance is dropped into water with which a person has contact

Occupational accidents can be the result of electric arcs from high-voltage power lines. Electric arcs occur when a burst of electricity jumps from one electrical conductor to another, creating bright flashes.

Factors that may increase the chances of an electrical burn or injury include:

- having an occupation with exposure to electric currents, such as a utility worker
- having an occupation that involves outdoor work, such as agriculture
- being outside during a thunderstorm
- working with electrical installations or appliances

## Radiation Burns

Radiation burns are injuries to the skin or tissue caused by sunburn, radiation therapy for cancer treatment, and, in rarer instances, nuclear emissions or explosions. The damaging effects of radiation depend on the type of radiation, its energy, penetration and ionization power, total dose, number of exposures and overall exposure time. Radiation skin injuries range from redness and shedding or peeling of the skin to deep skin ulceration.

## Chemical Burns

A chemical burn, or caustic burn, can occur when skin or tissues come into contact with a chemical irritant. The irritant can cause a reaction on the skin or, if swallowed, can cause burns on the tongue, mouth, esophagus and stomach tissue. Some of the most common products that can cause chemical burns are:

- car battery acid
- bleach
- ammonia
- denture cleaner
- teeth-whitening products
- pool chlorination products
- oven cleaner
- lye

## Did you know:

**Both heat and cold** can burn a person's skin. If exposure to severe cold causes skin damage, it is called an *ice burn* or *frostbite*.

## Who is at highest risk for burns?

Did you know a child's skin burns four times more quickly and deeply than an adult's when exposed to hot objects or liquids of the same temperature? In addition, elderly burn patients suffer from poorer health and higher rates of death than younger patients with similar burns (see Table 1).





**Table 1:** Burn Statistics

Type of Burn	Most Affected
Fire/Flame/Smoke	Males aged 50–64, females aged 20–29
Scalds (hot water, steam, food, oil, grease, liquid glue or hot wax)	Children 1 year of age or younger
Frostbite	Adults aged 30–49
Contact Burn (hot surfaces and objects)	Children 4 years of age or younger, especially less than or one year of age
Electrical	Children less than 1 year of age and males aged 20–29
Sunburn (radiation)	Males and females aged 20–29

## What do burns look like?

Burns are typically identified by the degree of tissue destruction, ranging from superficial (first-degree) to full-thickness (third-degree). It is important to note that even when the burn has healed the area will always remain damaged to the full extent of the burn, with major burns (full-thickness/third-degree) resulting in permanent scarring (see Table 2).

**Table 2:** Typical Clinical Appearance of Burn Depth

Depth of Injury	Appearance	
<b>Superficial (First-degree) Burn</b>	<ul style="list-style-type: none"> <li>• Involves only the outer layer of the skin (epidermis), and never blisters</li> <li>• Appears as a sunburn</li> </ul>	
<b>Partial-thickness (Second-degree) Burn</b>	<ul style="list-style-type: none"> <li>• Goes deeper than the surface but not to muscle or bone</li> <li>• Pink, painful, moist, blisters, intact hair follicles</li> </ul>	
	<ul style="list-style-type: none"> <li>• Deep</li> <li>• Mottled or white, dry, less feeling in the area or a complete loss of feeling, hair follicles damaged</li> </ul>	
<b>Full-thickness (Third-degree) Burn</b>	<ul style="list-style-type: none"> <li>• Dry, white or charred, leathery, complete loss of feeling</li> </ul>	

## First Aid and Emergency Management

The treatment of burns depends on the location and severity of the damage. The top priority of care is to *stop the burning process*. Sunburns and small scalds can usually be treated at home. Deep or widespread burns and burns on children need immediate medical attention. Some people may need treatment at a specialized burn centre and months of follow-up care.

### Thermal Burns

#### Fire:

- **If it is safe to do so**, encourage or assist the person to move away from the fire scene.
- If the person's clothing or hair is on fire, encourage them to "stop, drop, and roll" or smother the flames with a heavy blanket or coat (if required and if it is safe to do so).
- Encourage or assist the person to remove any smoldering, hot or burned clothing. If the clothing is stuck to their skin, cut any loose material off.

#### Scalds and contact burns:

- Stop the burning process by encouraging or assisting the person to stop contact with the hot (or extremely cold) liquid or object.

#### For all heat-related thermal burns:

- Encourage or assist the person to remove all tight clothing and jewellery near the burn injury.
- Cool the burn:
  - Hold burned skin under cool (not cold) running water or immerse in cool water until the pain subsides (usually around 5 to 15 minutes).
  - Use cool compresses (clean cloths) if running water is not available.

#### For all cold-related thermal burns (frostbite):

- Encourage or assist the person to get out of the cold and remove any wet clothing. It is important that they **do not** walk on frostbitten toes or feet.
- Protect the affected areas with dry, warm clothing or by tucking hands into the armpits or groin until a safe area is reached.
- Then, warm the affected areas by placing them in warm (not hot) water for about 30 minutes or until the skin becomes its usual colour.

#### Protect the burned area:

- Cover the burn injury with a sterile, non-adhesive bandage or clean cloth.
- For minor burns that do not require medical attention, consider applying an ointment to the injury two to three times per day as part of the dressing change. Ask your pharmacist or health-care professional for product suggestions. Do not apply butter.

#### Treat the pain:

- If the burn is minor and you do not plan on going to the emergency room, consider taking an over-the-counter pain reliever to manage any pain associated with the burn injury, such as ibuprofen or acetaminophen. Ask your pharmacist or health-care professional for advice if you are uncertain which pain reliever is right for you.

#### Seek medical help if:

- You see signs of infection, like increased pain, redness, swelling, fever, or oozing from the burn injury.
- The burn blister is larger than 5 cm or oozes.
- The pain gets worse or lasts for more than a few hours.
- The hands, feet, face, or genitals are burned.

## Electrical Burns

- **If it is safe to do so**, cut the power source by throwing a switch or circuit breaker, or unplugging the power. **Do not endanger yourself.**
- For serious electrical burns, call for emergency medical services right away.
- Treatment depends on the voltage, the individual's response to the electric shock and their injuries:
  - Less severe symptoms may only require observation and time to fade.
  - Some symptoms can linger over long periods of time.
  - Severe shocks that have caused the heart to stop, a loss of consciousness, seizures or severe injury will need emergency help, and first aid must be done quickly to restore breathing and prevent further injury or death. Some emergency steps may include:
    - **Cardiopulmonary resuscitation** (CPR) if the heart has stopped beating – until advanced care is attained
    - Airway and breathing support
    - Intravenous fluids to restore balance in the body

## Radiation (Sunburn) Burns

- Get out of the sun.
- Take frequent cool baths or showers to help relieve the pain. After showering, gently pat the skin dry (do not rub) and apply a non-scented moisturizer to help trap the water in your skin.
- Consider using a moisturizer that contains aloe vera or soy to help soothe sunburned skin.
- Take over-the-counter pain relievers/anti-inflammatories to help reduce any swelling, redness and discomfort (if required and appropriate). Ask your pharmacist or health-care professional for advice if you are uncertain which pain reliever is right for you.
- Drink extra water to prevent dehydration.
- If you have skin blisters, allow them to heal—do not pop them—as blisters form to help your skin heal and protect you from infection.
- Protect sunburned skin while it heals. Avoid sun exposure if possible, and if not, wear protective clothing.

## Chemical Burns

Take these steps immediately, if possible:

- For chemicals in liquid form, flush the chemical off the skin by rinsing the skin under lukewarm running water for 10 to 20 minutes.
- For chemicals in powder form, brush off any remaining powder from the skin before flushing with water.
- If the chemical has come into contact with your eyes, flush your eyes continuously with lukewarm running water for at least 20 minutes and seek emergency care.
- If the chemical is swallowed, dilute the chemical by drinking water or milk and seek emergency care.
- If the burn is on the skin, and after it has been flushed clean, cover the burned area loosely with a dry, sterile non-stick dressing or a clean cloth.
- If the burn is minor and you do not plan on going to the emergency room for assessment, consider taking an over-the-counter pain reliever (if required and appropriate). Ask your pharmacist for advice if you are uncertain which pain reliever is right for you.
- Go to the emergency room immediately if the burn is more serious.

### Important:

Have a fire escape plan and practise it with your family once a month. In the event of a fire, make sure to crawl underneath smoke. This will minimize the risk of passing out and becoming trapped in a fire.

### Note:

A tetanus or booster shot may be required for some burns. Check with your health-care professional.



## How can I prevent burn injuries?

Burn injury prevention should be considered a primary safety goal because all people are at risk for experiencing a burn injury in their lifetime—either at home, work or play. The aim for prevention is to learn about what the risks are for you and your loved ones, and then create a safe environment where everyone knows how to be safe. See [Keeping Your Home Safe](#) for more information.

### Fire-related Burns

- Install smoke alarms and consider installing sprinklers.
- Don't smoke indoors.
- Make a fire escape plan and practise regular fire drills.
- Use child-resistant lighters, and safely store lighters and matches.
- Use space heaters carefully – keep them away from anything that can burn.
- Never leave candles unattended. Consider battery-operated flameless candles instead.

### Scalds

- Lower water heater temperature (lower than 50 °C).
- Keep hot drinks away from table/counter edges.
- Avoid drinking hot liquids through a straw.
- Turn the handles of saucepans toward the back of the stove.
- Put cold water into baths first, then hot water and test the temperature with your hand before using, or use a visual temperature gauge.

### Frostbite

- Wear clothing that is suitable for the temperature and activity.
- Cover vulnerable areas like tips of ears and nose, fingers and toes.
- The wind can increase the risk of frostbite so dress accordingly.

### Contact Burns

- Test the temperature of car seats before placing children in them.
- Unplug hot irons and curling irons and keep them out of reach of children.
- Keep children away from hot cooking appliances and grills.
- Use approved glass or metal protective screens in front of fireplaces.
- Wear oven mitts to remove items from the stove.

### Electrical Burns

- Put covers on electrical outlets that are within a child's reach.
- Throw out electrical cords that are frayed or damaged.
- Avoid overloading extension cords or outlets.
- If flooding occurs, turn off electrical circuits before stepping into the water.
- Avoid using hairdryers or other electrical appliances near the sink and tub.

### Radiation Burns

- Avoid direct sun exposure between 10 a.m. and 4 p.m.
- Wear clothing with SPF 50+ protection.
- Wear sunglasses with UV protection.
- Avoid tanning and UV tanning beds.
- Apply sunscreen 30 minutes before going outside; reapply every 2 hours and after swimming.

## Chemical Burns

- Wear protective clothing/equipment when handling chemicals.
- Store chemicals out of the reach of children.
- When possible, purchase chemicals that are less toxic.
- Store chemicals in their original containers with the labels intact.
- Purchase chemicals with child-resistant closures.

Even though certain jobs put you at a greater risk for burns, most burn injuries occur at home. Other preventative measures you can take at home include:

- Keeping young children out of the kitchen while cooking
- Placing a fire extinguisher in or near the kitchen
- Testing smoke detectors once a month
- Replacing smoke detectors every 10 years
- Ensuring all smoking products are stubbed out completely – **don't smoke in bed.**
- Cleaning out dryer lint traps regularly
- Teaching children safety around open fires

## When is a burn an emergency?

According to the Canadian Red Cross call EMS/9-1-1 immediately if the burns:

- Make it difficult for the person to breathe
- Causes a great deal of pain or the person becomes unresponsive
- Were caused by chemicals, explosions, or electricity
- Involve a large amount of blistering or broken skin, or the burns cover the face, neck, hands, genitals, or a large surface area

For more information visit the The Canadian Red Cross website at: <https://frontlinefirstaid.ca/first-aid-and-cpr-guide.html>.

To learn more about what should be in a burn emergency kit go to: <https://products.redcross.ca/product/1753/burn-kit-in-abs-box>.



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Printed in Canada · 1958r1E

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