CHILD ACCIDENT PREVENTION FOUNDATION OF AUSTRALIA

Burns Information Guide

What is this guide?

The information detailed here will assist you in supporting young children/students to complete the activities and tasks in the BurnSafe learning portal (kidsafe.com.au/nbam-burnsafe-resources/).

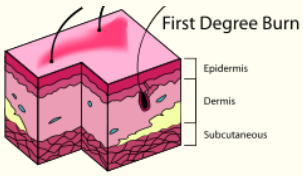
- Burn injury is one of the top three causes of unintentional injury in children under the age of 5 in Australia.
- The majority of burn related injuries are preventable and appropriate first aid will minimize the impact and severity of a burn injury.
- Children can play an important role in keeping themselves and their families safe.

About burn injury

Our skin is the body's largest organ and has many functions including moderating our temperature, retaining and maintaining fluid levels in the body, protecting us from bacteria and infections and is responsible for gathering sensory information. The skin consists of two distinct layers – the Epidermis (provides protection from injury, holds in fluids and protects the nerves from too much stimulation), and the Dermis (contains the capillaries, hair follicles, nerve cells and sweat glands). Underneath the dermis lies the padding layer of Subcutaneous Fat which separates the skin from deeper muscular and bony structures. These layers provide important cushioning from trauma. Burns are an injury to any layer of the skin and are caused by extreme heat or cold, contact with electricity, chemicals, friction or radiation. Burn severity is measured according to the depth of skin damage.

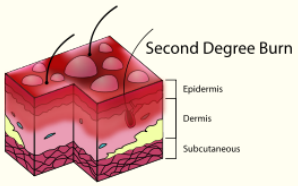
Superficial thickness burn (first degree)

Affects the outer layer or epidermis. Common symptoms include localised redness and pain.



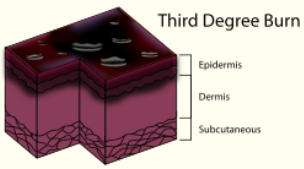
Partial thickness burn (second degree)

Affects the second layer of skin (the dermis) Symptoms include blisters, clear fluid emitting from the site and localised pain or with a whitish appearance for a deeper burn and deeper damage. This burn may have limited associated pain due to damage to the blood vessels and nerve endings.



Full thickness burn (third degree)

Often leaves a hard leather like eschar (a dry dark scab) purple fluid and little or no pain due to the depth of damage. Skin may appear whitish or black depending on the type of burn.



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Glossary of burns terminology

Skin Layers:
Epidermis - The protective waterproof to layer of skin.
Dermis - The second layer of skin containing hair follicles, oil glands and sweat glands.
Subcutaneous - Sometimes called the third skin layer, this is a layer of fat which joins the skin to the body, it cushions the body from the outside world and assists with insulation.

Depths of a Burn:
Superficial - a burn that damages the epidermis only.
Partial thickness burn- A burn that damages both the epidermis and the dermis and can be a mid-dermal or deep dermal burn, depending on its depth.
Full thickness burn - A burn that damages the epidermis, the dermis and the subcutaneous layer.

Contractures - A permanent tightening of the skin restricting the body's movement or when the growing body of a young person outgrows the damaged area. An operation requiring skin grafts is required to release the skin

Implications for a severe burn injury

The implications for a young person experiencing a severe burn injury can have a major impact beyond the individual to their parents, siblings and friends. Not only does a burn injury disfigure physically, it can also change lives socially, psychologically, emotionally and financially.
The care requirements of burn patients are often considerable, complex and the consequences can last a lifetime. Immediate hospitalisation for a severe burn injury can be anywhere between 1 week up to 1 year, with further recovery time needed at home before they are ready to return to regular daily activities.
The skin, which has been damaged even to a partial thickness burn injury, loses its ability to stretch, sweat, control its temperature and safely absorb sunlight. This is due to the destruction of the sweat glands, hair follicles, nerve endings and melanin which are all located in the epidermis and dermis, the two outer layers of skin. This can greatly restrict mobility and subsequent participation in some social and physical activities. It also means that, as the young person grows and develops, the damaged skin will not grow and stretch causing contractures. Ongoing surgery is required to release the skin and graft new skin into the area.
A burn in a young person will also affect parents and family members including support for ongoing treatments, dressing changes and rehabilitation. Travel and time away from normal routines can be draining on the family and may impact on parents' working lives and their ability to continue with normal family routines.

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Impact of severe burn injury

Education & Family

Children who return from a lengthy hospital stay may struggle fitting back into the early learning setting or classroom;coping with work they've missed, fitting back in with friends as well as dealing with the emotional, physical and social impacts of a burn injury which can have a serious and lengthy effect on the child's self - esteem. The length of hospital stay and rehabilitation phase also greatly affects the life (work and social) of the child's parents causing further stress on the family (financial and time management)

Social & Emotional

The physical effect of a burn can be disfiguring and difficult for anyone, but especially those who are still growing and developing their identity in their immediate world and beyond

Physical

Scarring is especially of concern if over a joint and the scarring prevents normal function. Children with severe burns can expect a hospital stay from 1 week up to 1 year, which is likely to have a serious impact on the family's working life and finances as well as on the child's education

Surgery

Many burns survivors are affected by their burns for life. A deep partial or full thickness burn can cause the skin to scar, which if over a large area can require ongoing operations to release contractures (skin contracting) or to enhance the skin's appearance.

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Burns First Aid Management

Importance Of First Aid

Burn injuries continue to burn the skin for up to 2-3 hours after the cause of the burn has been removed. It is therefore vital that the burn area is cooled effectively to prevent further damage. Cool running water for 20 minutes within the first hour of injury will stop the burning process and cool the burn. First aid will reduce the severity of the burn even if administered up to 2-3 hours after the burn impact. Ice, butter, tomatoes, or toothpaste are all commonly suggested home remedies but should never be used as they can cause deeper tissue damage.

Ensure Your Own Safety

Before tending to another's burn injury, ensure the area is free from danger, including things such as hot oil, water spilt on the floor or gases which may be leaking. If you are injured, you are less able to care for the patient.

Correct Burns First Aid

REMOVE jewellery and clothing from the burn area
Clothing, nappies and jewellery can hinder the healing process in two ways. Clothing and jewellery can retain heat and can also restrict the body if swelling occurs. (A burn will continue to burn the skin until the area cools)

COOL the burn under cool running water for 20 minutes
The longer a burn is left untreated, the deeper and more serious it becomes. It is therefore vital that cooling the burn area is the critical first step in burn first aid management. Ideally this should be done under cool running water however if running water is not available, two dampened cloths can be used and alternated as heat will be transferred from the burn area to the cloth quite quickly. If the burn surface area is large i.e. front or back torso of a child, or full arms, the body may lose heat due to the skin losing its ability to regulate normal body temperature. Children can become cold very quickly if the burn is large. At any sign of shivering or shock the patient should lay down and be loosely covered to keep warm.

COVER the burn area with a clean lint free cloth or cover loosely with cling wrap
Many burn complications arise as secondary conditions to the burn itself. These are commonly related to shock, toxicity to the area or local infection of the wound and surrounding tissue. To reduce the likelihood of infection and to assist the body in retaining body warmth it is advised to cover the burn injury loosely with a plastic cling wrap or clean, lint free cloth. It is important to wrap the area loosely to allow for some swelling of tissue.

SEEK medical advice
If the burn area is larger than a 20 cent coin **or** on the face, hands, feet, groin area, in skin folds or if there is potential damage to the lungs and throat seek immediate medical attention.

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Burn Classifications

Scald Burn

A scald is a burn caused by contact with hot liquid or steam. It can present in a superficial, partial thickness or full-thickness burn. The most common area for a scald is on the face, hands, arms and chest through a young child pulling a cup down from a table or bench or in the throat through drinking milk or drinks which are too hot. Babies and young children have fragile skin and their skin burns deeper and more quickly than adults and at a lower temperature.

Friction Burn

Friction burns are caused by an aggressive moving contact with any hard or rough surface such as treadmills, roads, carpets, or other floor surfaces. Injuries caused by friction are usually both an abrasion and a heat burn and generally happen through a fall or vehicle accident, especially motor bike, bicycle or skateboard. They can be quite painful due to the large number of nerve endings which have been exposed to the air. First aid for a friction burn follows a similar format to that of other burns, however if there are particles in the wound these should be removed by a doctor or other health professional. The wound should be covered to avoid infection.

Contact/Thermal Burn

Contact burns happen when the skin comes into contact with hot or extremely cold materials or environments. Often these burns occur with the use of household appliances and fixtures during routine activities of daily life, such as vehicle exhausts, ovens, heaters and hair straighteners.

Chemical & Acid Burns

Most chemicals that cause burns are either strong acids or bases. A variety of household products fit this description including bleach, drain/toilet cleaners, metal cleaners, concrete mix and pool chlorinators. Chemical burns can be deceiving and many may take several hours to begin the chemical reaction with your skin. It is vital that any contact with these chemicals is quickly followed by removing any powders from the skin and thoroughly washing the affected skin for at least 20 minutes. Signs and symptoms of a chemical burn may include redness, irritation or burning at the site of contact, feeling of numbness or blistering at the site of exposure, a cough or shortness of breath, muscle twitching and headaches. Chemical burns can be very unpredictable. Always seek medical attention.

First Aid should include:

- Ensure the area you are in is free from chemicals
- Remove any contaminated clothing
- Gently brush away any solid materials and wash the injured area for at least 20 minutes, taking care not to allow runoff to contact unaffected parts of your body.

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Burn Classifications (continued)

Radiation (Sunburn)

Melanocytes are active cells which are produced in the Epidermis, our outer layer of skin which, when exposed to radiation, produce Melanin. Melanin absorbs the ultraviolet energy from the sun and transforms it into the brown pigment which can give us a tanned appearance. It also helps to prevent sunburn and cell damage. In Australia, sunburn can occur in less than 15 minutes on a clear summer day during the most intense UV time of between 10am - 2pm or 11am - 3pm during daylight saving. Sunburn symptoms are a reddening of the skin, localised pain and possibly blisters. Skin turns red within 2 to 6 hours of being burnt and will continue to develop for the next 24 to 72 hours. For severe sunburn other symptoms may also include dizziness, nausea or headaches. Medical assistance should be sought if these symptoms occur.

Suggested First Aid for sunburn includes:

- Keep the area out of the sun to avoid further damage
- Cool the skin through cold compresses or cool showers
- Drink plenty of fluids to avoid dehydration

Fire & Flame Burns

A flame burn occurs when the skin comes into contact with the heat of a flame. We use fire in our everyday lives which makes it a source of attraction for many children and they are often unaware of the dangers. A cigarette burns at 5850C, a candle at 1000oC, and a bush fire at 20000C or above causing significant damage to anything which crosses its path. Generally, the heat from a flame is enough to warn us to avoid being injured, however as long as there are the essential elements of oxygen and fuel, fire will be sustained and unpredictable and we may not have the ability to avoid being injured. The action of 'Stop, Cover, Drop and Roll' is advised for anyone whose clothing has caught on fire.

- Stop – as fire requires oxygen to burn, stopping any quick movements restricts the flow of air around the flame so it will not burn as fiercely
- Cover – this is using the hands to cover the face and neck. These body areas have very delicate and sensitive skin and soft tissue parts. Burning to the face in particular can cause horrific scarring and can 'melt away' the soft tissue structure of the nose, ears, lips and eyes.
- Drop - drop to the ground
- Roll - rolling backwards and forwards in a rocking motion will also restrict the air flow around the flame and will help to 'stamp out' the fire.

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Burn Classifications (continued)

Electrical Burns

Electricity, when uncontained will always take the shortest path to the earth. As people are conductors of electricity, this can mean that an electrical current such as lightening may arc towards a body to reach the earth quickly. When an electrical current passes through the body it burns tissue along the path it takes, often causing severe internal burning. With electrocution, an entry and exit point will always be evident and if the skin is moist through water or perspiration, burning of the skin will also be a result of contact.

Household Appliances: Electrical currents flowing through wires produce an excess of friction and heat which can be unpredictable in certain circumstances. If power points are overloaded, the additional heat can cause sparks or enough heat to start a fire (especially if there is fuel nearby), the cause of many house fires has been attributed to this. If the cord of an appliance is frayed or damaged, the electrical current can leak into the surrounding atmosphere. If the atmospheric conditions are conducive i.e. damp or humid, it is possible for the electricity from a frayed toaster cord for example to arc through the air and pass through the human body or fuel source as the shortest and easiest route to reach the earth, resulting in electrocution or fire.

Lightning is another form of electricity which is unpredictable as it is uncontrolled. It is a form of electricity and referred to as static electricity. Static electricity and electrical currents which we harness to produce energy are in effect the same, however, in the case of static electricity, the electrons are moving slowly or are static. We get a reaction when the electrons are suddenly discharged from their host atom all at once. This can produce a slight tingling effect if transferred to a human body through to a major jolt, resulting in the symptoms of electrocution.
Electrical shocks can vary in severity from a slight tingling sensation/discomfort, through to a massive shock with major internal and external burn injuries. The extent of injury depends on the strength of the current, the amount of time a person is in contact with the electrical source and body parts, organs and tissues the electricity comes into contact with. Electrical pulses will often cause muscles to spasm and contract, which is why it may be difficult for a person experiencing a shock to let go of the appliance or conductor.
Other effects may include:

- Heartbeat stopping or palpitating
- Difficulty in breathing
- Fainting or losing consciousness

First Aid for an electrical burn is consistent with all burns first aid, however, medical assistance must always be sought as there may be little or no evidence of internal damage.