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Avoid haste in fire rescues

It is tempting for you as a police officer to rush in and help someone you see on fire in front of you. But basic first aid is about seeing to your own safety before helping someone in danger.

To avoid being burnt, you need protection for as much of your skin as possible. You should cover it with non-flammable material, and two layers are better than one.

Many burns occur when energy stored within the layers of protective material is suddenly transferred to the fire-fighter or rescuer.

Protective material (fire-fighters' turnout coats and pants) is designed to insulate from the thermal environment. A series of protective layers and air gaps prevent the energy of the fire environment from being transferred to the skin.

The severity of a burn relates to the depth of that burn and the amount of surface area burnt. The first threat to a survivor's life is fluid loss from the blisters; the second is infection, which starts because of the open wounds left by blisters and other skin damage.

Doctors estimate the extent of burns by the "rule of nines" for 11 areas of the body, which make up blocks of 9 per cent of surface area. It is 9 per cent for each upper limb, 2 x 9 per cent for each leg, 2 x 9 per cent for front of torso, 2 x 9 per cent for the back of the torso. The face makes up 9 per cent and the pubic area the last 1 per cent.

Internal burns, from breathing in flames or hot air, add the extra complication of mouth and lung damage. Remember that, if someone you are helping appears short of breath, he or she might have lung damage.

First-, second- and third-degree burns relate to the depth of the injuries. Direct heat from fire is the most common cause, but damage – both internal and external – can also be done by radiation, sunlight, electricity or chemicals.

First-degree burns are red and painful. They swell a little; they turn white when you press on the skin. The skin over the burn might peel off after one or two days.

Second-degree burns are thicker burns, very painful and typically produce blisters on the skin. The skin is very red or splotchy, and might be very swollen.

Third-degree burns cause damage to all layers of the skin. The burned skin looks white or charred. These burns might cause little or no pain initially because the nerves and tissue in the skin are damaged.

It is generally better not to put butter or oil on burns. Keeping the skin cool helps preserve undamaged tissue by slowing the metabolism and causing local hypothermia. But do not put ice or ice water directly onto second- or third-degree burns. There is a risk of infection once the protective integrity of the skin is damaged, so minimizing that risk is essential. For the same reason, if blisters form over the burn, do not break them.

If a person suffers an electrical burn (from a power line, for example) it is important to check – after turning off the power source – for serious injury to organs inside the body. Such injury might not show on the skin.

A chemical burn (especially to the eyes or mouth) should be flushed with large amounts of cool water. And there is a trade-off in risking future infection against the benefit of diluting the chemical.

Take off any clothing or jewellery with the chemical on it. It is better not to put anything on the burned area, such as antibiotic ointment. But, once the chemical has been washed off, wrap the burn with dry, sterile gauze or a clean cloth.

Burns are painful at the outset, and then we treat them with dressings which have to be changed.

Over the years, treatment has changed from regular wound dressings changed daily to longer-lasting dressings changed weekly. Either way, there is great pain associated with changing a dressing.

For severe burns, the initial dressings are often done under a general anaesthetic. Later, painkillers such as morphine are given before dressings are changed. In these severe cases, patients might spend weeks in hospital for treatment of their burns and management of the infection risk.

After all this there might come years of severe scarring and contractions of limbs, which need surgery (cosmetic and functional).

Scarring is either keloid, hypertrophic or contracture-causing. Keloid scars result from an overgrowth of scar tissue. They grow beyond the site of the injury and are generally red or pink but become a dark tan.

Hypertrophic scars are red, thick and raised. Unlike keloid scars, they do not develop beyond the site of the injury or incision.

A contracture scar is a permanent tightening of skin. It might affect the underlying muscles and tendons which limit mobility and cause damage to or degeneration of the nerves.

The pressure garment is a major new development which reduces long-term contractures. Normal, undamaged skin is made up of connective tissues in the dermis. These form a three-dimensional mesh or collagen fibres aligned parallel to the skin's surface.

The skin applies pressure against its underlying layers. Normally, the pressure that the skin puts upon the body ensures that injured skin is replaced to its original state without scarring.

When burns destroy the skin and the papillary dermis, normal pressure by these layers no longer exists. Without this pressure, hypertrophic scars will form irregularly and possibly cause deformities.

Pressure garments prevent and control the formation of hypertrophic scars by applying counter pressure to the wounded area.

It is imperative that burns patients begin wearing pressure garments while the scar is active and immature. Most patients will need to wear their garments for 12 to 18 months.