



## X-Plain Burns

### Reference Summary

#### Introduction

1.25 million burn injuries require medical attention in the United States every year.

Burns can be mild or very severe, requiring hospitalization and possibly more than one surgery.

This reference summary explains burns and how they can be treated.

#### The Skin

The skin is the body's outer covering. It protects us against heat, light, injury, and infection. It also regulates body temperature.

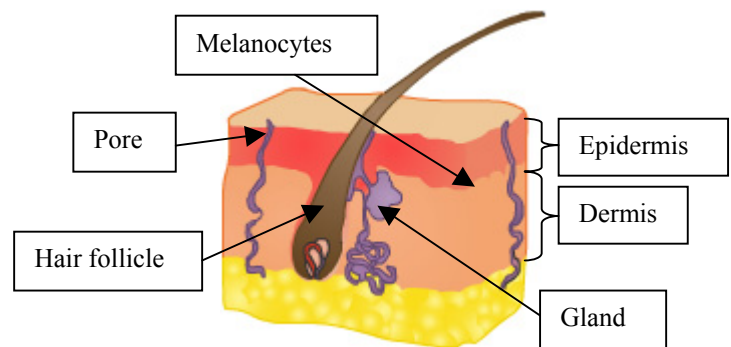
Weighing about 6 pounds, the skin is the body's largest organ. It has 2 main layers: the outer *epidermis* and the inner *dermis*.

The epidermis, or outer layer of the skin, is mostly made of flat, scale-like cells called *squamous* cells. Under the squamous cells are round cells called *basal* cells.

The deepest part of the epidermis is made of cells called *melanocytes*. Melanocytes produce melanin, which gives the skin its color.

The dermis, the inner layer of the skin, contains

- Blood vessels
- nerves
- lymph vessels
- hair follicles
- glands



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The skin's glands produce sweat, which helps regulate body temperature. They also produce sebum, an oily substance that helps keep the skin from drying out. Sweat and sebum get to the surface of the skin through tiny openings called pores.

The skin contains a fine network of nerves. This network gives us the ability to feel sensations and pain.

## Burns

A burn is damaged tissue caused by heat, chemicals, electricity, sunlight, or nuclear radiation.

Burns caused by scalds, building fires, flammable liquids and gases are most common.

Burns are divided into 3 different degrees, depending on how severe the damage is to the skin and its underlying tissues.

- 1<sup>st</sup> degree burns only affect the outer layer of the skin called the epidermis.
- 2<sup>nd</sup> degree burns damage the epidermis and the dermis, the layer underneath.
- 3<sup>rd</sup> degree burns involve damage or complete destruction to the fullest depth of the skin and underlying tissues. People who experience 3<sup>rd</sup> degree burns often require skin grafts.

## Symptoms and Treatment

1<sup>st</sup> and 2<sup>nd</sup> degree burns are very painful. 3<sup>rd</sup> degree burns are usually NOT painful because the nerves that supply the pain sensation are destroyed.

Burns cause severe damage to blood vessels. This type of damage causes fluid to seep out of the blood vessels, which causes swelling and blistering.

In very severe cases with extensive burns, loss of fluid can lead to depletion of blood volume, shock, and dangerously low blood pressure. Death is likely if the fluid is not replenished.

Immediate transfusion with blood or a salt solution may be required to replace fluid and maintain blood pressure.

Burns often lead to infection due to damage of the skin's protective barrier.



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In many cases creams or ointments with antibiotics in them are applied to the skin to prevent and treat infection.

1<sup>st</sup> and 2<sup>nd</sup> degree burns can heal over time without skin grafts since there is enough underlying skin tissue to rebuild the skin.

3rd-degree burns need skin grafts or application of artificial materials to cover and protect the exposed areas, as well as trigger new skin to grow.

Bandages must be changed very frequently for all degrees of burns to speed healing and prevent infections.

Infections caused by the burn can also occur elsewhere in the body. Blood infection called septicemia, and lung infection called pneumonia, can complicate severe burns. Such infections result in death for 10,000 people per year in the United States.

Since extensive burns usually increase metabolism, nutritional support is very important to help patients survive the burn.

Approximately 50,000 burn patients require hospitalization, and about 1/2 of all burn patients are admitted to a specialized Burn Unit or Intensive Care Unit (ICU).

Adult respiratory distress syndrome, or ARDS, causes the lungs to fail. Patients with severe burns commonly get ARDS, which can result in death.

Scarring may result from the burns. Recent advances in plastic surgery can improve the appearance of some of these scars.

## Summary

Twenty years ago, burns covering 1/2 the body frequently ended in death. Today, patients with burns covering even 90% of their body can survive.

The quality of life for burn patients continually improves as the methods of wound healing and tissue repair keep getting better.



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