

MANAGEMENT OF PATIENT WITH BURNS



Definition

- Injuries that result from direct contact or exposure to any physical, thermal, chemical, electrical, or radiation source are termed as Burns.

CLASSIFICATION

Etiology

➤ Based on **Cause**

- **Thermal**
- **Electrical**
- **Chemical**
- **Radiation**
- **Inhalation**

Thermal Injuries

- Most common
- Types : Dry & wet

Contact

- Direct contact with hot object (i.e. pan or iron)
- Anything that sticks to skin (i.e. tar, grease or foods)



Flame

- Direct contact with flame (dry heat)
- structural fires / clothing catching on fire

▶ Scalding

- ▶ Direct contact with hot liquid / vapours (moist heat)
- ▶ Cooking, bathing or car radiator overheating
- ▶ Single most common injury in the paediatric pt



Electrical Burns

- Usually follows accidental contact with exposed object conducting electricity
 - Electrically powered devices
 - Electrical wiring
 - Power transmission lines
- Can also result from Lightning
- Damage depends on intensity of current

- **Low-tension injuries(<1000 V)**

- Low energy burns → Minimal damage to subcutaneous tissue
- Entry & Exit points – fingers → small deep burns
- AC → Tetany within muscles, cardiac arrest due to interference with normal cardiac pacing

- **High-tension injuries(>1000V)**

- Earthed high tension lines → Arc over the patient → Flash burn

- **Severity depends upon:**

- what tissue current passes through (Low voltage/ High voltage)
- width or extent of the current pathway
- AC or DC
- duration of current contact

- Lightning

- HIGH VOLTAGE!!!
- Injury may result from
 - Direct Strike
 - Side Flash

Chemical Burns

- Usually associated with industrial exposure
- Accidental mishandling of household cleaners

Degree of tissue damage determined by

- Chemical nature of the agent
- Concentration of the agent
- Duration of skin contact

Acids- Eg- Formic acid, sulphuric acid

Alkalis - Eg. Lime, potassium hydroxide



Radiation Exposure

- Waves or particles of energy that are emitted from radioactive sources
- Alpha radiation
 - ✓ Large, travel a short distance, minimal penetrating ability
 - ✓ Can harm internal organs if inhaled, ingested or absorbed
- Beta radiation
 - ✓ Small, more energy, more penetrating ability
 - ✓ Usually enter through damaged skin, ingestion or inhalation

INHALATION

- **Smoke and inhalation injury**

- carbon monoxide poisoning

- inhalation injury above glottis

- inhalation injury below glottis

According Depth of burn

- *Superficial Partial-Thickness (First Degree burn)*

cause- Sunburn

Low-intensity flash

Skin involvement- Epidermis

Symptoms- Reddened, Tingling, Pain that is soothed by cooling



Deep Partial-Thickness (Second Degree)

Cause

- Scalds
- Flash flame
- Contact burns
- chemical

Skin involvement- Epidermis, upper dermis, portion of deeper dermis

Manifestations- Blisters that are red, shiny. Severe pain caused by nerve injury, mild to moderate edema

- Recovery in 2 to 4 weeks, some scarring and depigmentation contractures



Full-Thickness (Third Degree)

Cause-

- Flame
- Prolonged exposure to
- hot liquids
- Electric current
- Chemical

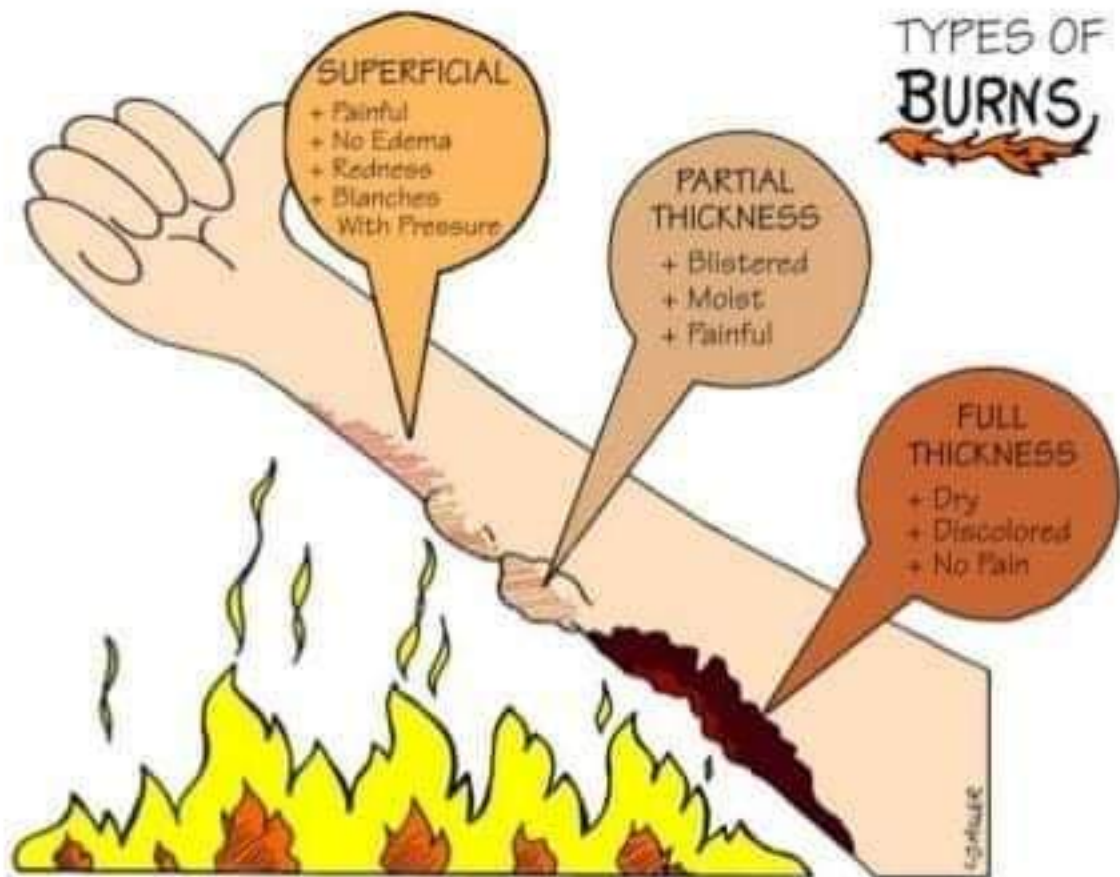


Skin involvement- Epidermis, entire dermis, and sometimes subcutaneous tissue; may involve connective tissue, muscle, and bone

Manifestations- Dry; pale white, Leathery, visible thrombosed blood vessels

- Pain free, all skin elements and local nerve endings are destroyed, surgical intervention required for healing

TYPES OF BURNS



PALM METHOD

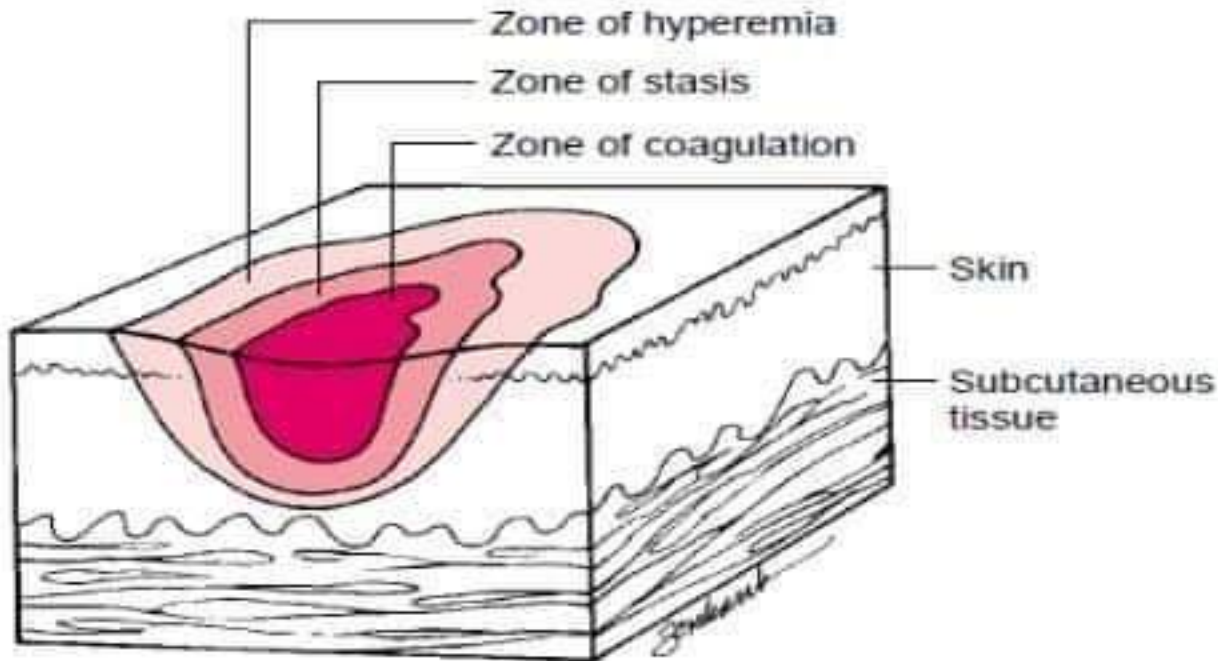
- In patients with scattered burns, a method to estimate the percentage
- of burn is the palm method. The size of the patient's palm is approximately 1% of TBSA.



Location of burn

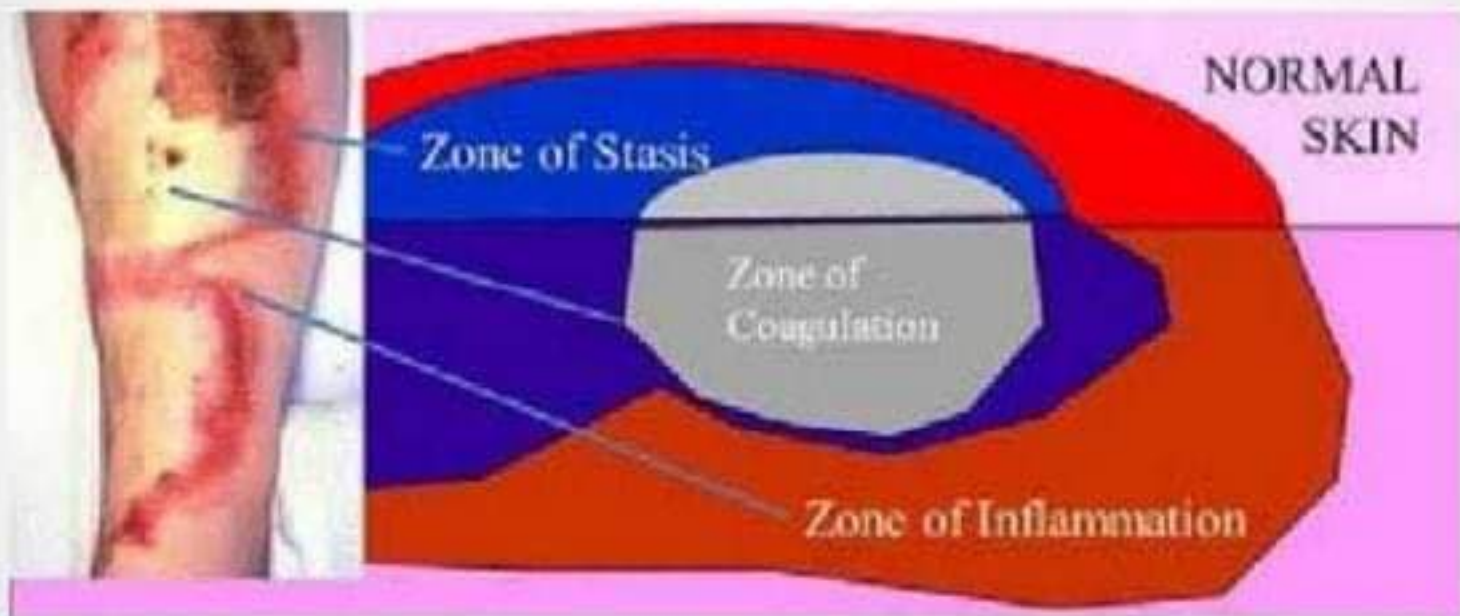
- Burns to face, neck ,chest and back may inhibit respiratory function due to mechanical obstruction secondary to edema, eschar formation
- Burns to the ear, nose are susceptible to infection because of poor blood supply
- Burns to buttocks, genitalia are susceptible to infection because of contamination
- Burns on extremities cause circulatory compromise and neurologic impairment.

Zones of burn injury



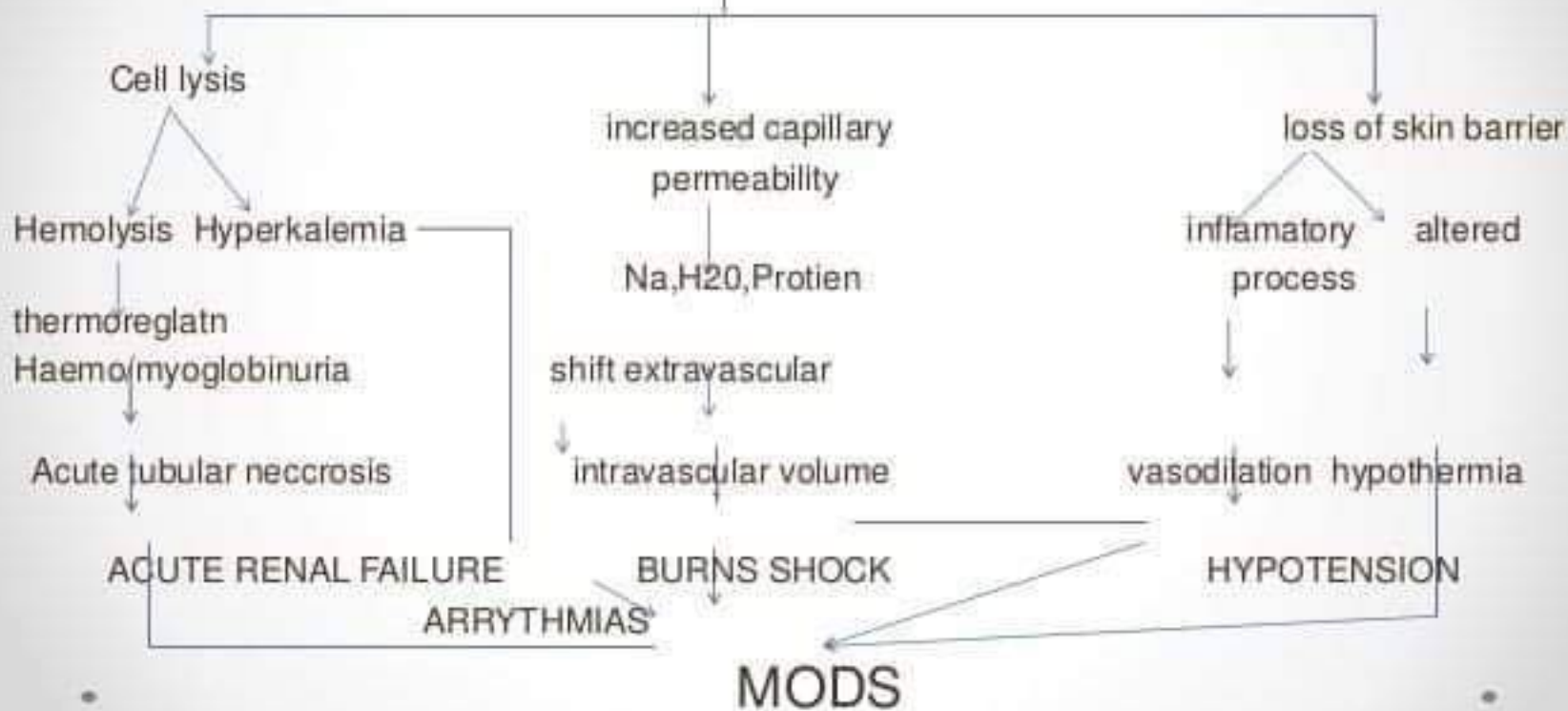
Zones of burn injury

- The inner zone (known as the zone of coagulation, where cellular death occurs) sustains the most damage
 - Necrotic area with cellular disruption
 - Irreversible tissue damage
- The middle area, or zone of stasis, has a compromised blood supply, inflammation, and tissue injury, Can survive or go on to coagulative necrosis depending on wound environment
- The outer zone—the zone of hyperemia—sustains the least damage



Pathophysiology

Burns > 30%



MANAGEMENT

Phases of burn management

- 1. emergent phase/resuscitative phase
- 2. Acute phase/ wound healing phase
- 3. Rehabilitative phase/Restorative phase

PRE HOSPITAL MANAGEMENT

- Rescuer to avoid injuring himself
- Remove patient from source of injury
- Stop burn process
- Burning clothing; jewelry, watches, belts to be removed
- Pour ample water on burnt area (not ice/ ice packs – skin injury & hypothermia)

Evan's formula

- Requirement for first 24 hrs
 - Colloids : 1ml/kg/% burn
 - Saline : 1ml/kg/% burn
 - D5 : 2000ml
- Requirement for second 24 hrs
 - ½ of first 24 hrs

Wound care

- Wound care should be delayed until a patent airway, adequate circulation and adequate fluid replacement have been established.
- 2 types of wound treatment used to control infection
 1. open method
 2. multiple dressing change method

Closed method

► Advantages

- Less wound desiccation
- Decreased heat loss
- Decreased cross contamination
- Debriding effect
- More comfortable

• Disadvantages

- Time consuming
- Expensive
- Increase chances of infection if not changed frequently