Why do people die from burns?

Shock, dehydration, sepsis

If pt survives first 72 hours → **infection**

Universal Trauma Model

American Burn Association (ABA)
- Develops strategies, prevention, research

PRIMARY GOAL IS **PREVENTION**!

Burn: alteration in skin integrity resulting in tissue loss/damage

4 Major Types/Causes of Burns

Thermal	Chemical
Electrical	Radiation

Thermal Burns

MOST COMMON

Due to exposure to dry heat (flames) or moist heat (steam, hot liquids)

Direct exposure to heat = cell destruction

Includes inhalation injuries r/t gases (CO) & particles

Chemical Burns

Direct skin contact w/ acidic or basic agents
- Treating acidic easier than basic (caustic)

May cause local tissue damage, system tox.

Damage can continue until traces disappear

Includes powders & gases

Treat quick to flush pH & lessen damage

Electrical Burns

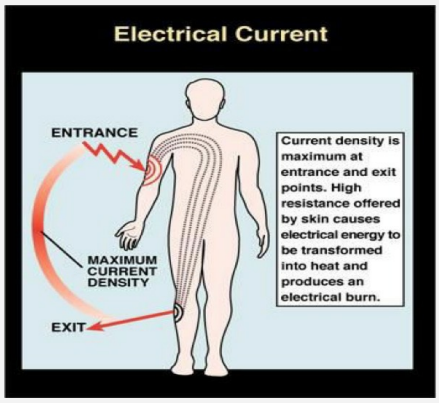
Higher mortality than thermal burns
- Can generate a lot of damage, subdermal
- high resistance off of tissues

Destructive process of electrical burns persists for weeks beyond the insult

Has an "exit wound"

Affects...
- Muscles & bones
- Heart (dysrhythmias)
- Rhabdo → AKI, acute tubular necrosis

Electrical Burns - Electrical Current

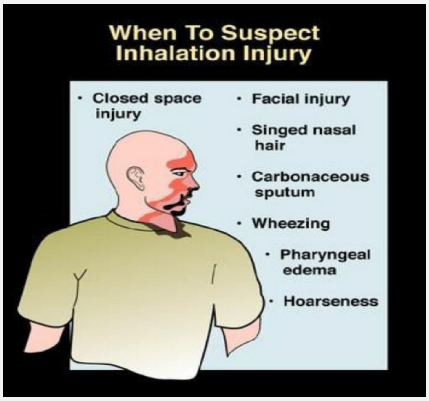


Radiation Burns

Caused by solar or radioactive agents
- *UV burns, thermal radiation, ionizing radiation (x-rays)*

Also may include friction burns r/t trauma

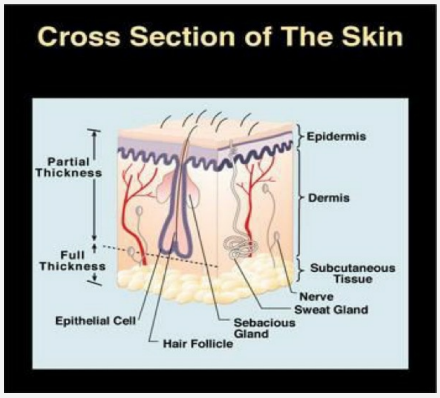
Inhalation Injuries



Result of resp. tract exposure to direct heat, chemicals, or carbon monoxide poisoning

CO poisoning: CO takes over RBC's → AMS, HA, dizzy → 100% NRB

Cross Section of the Skin



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Burn Severity Affected By...

Length of exposure	Mechanism of injury
Depth of burn	Location on body
TBSA %	Age - children, older
PMH - DM, CHF	

Entire leg → risk of compartment syndrome
Perineum → risk of infection

Functions of the Skin

Protective barrier

Assists w/ fluid & elect. balance

Thermoregulation

Excretion

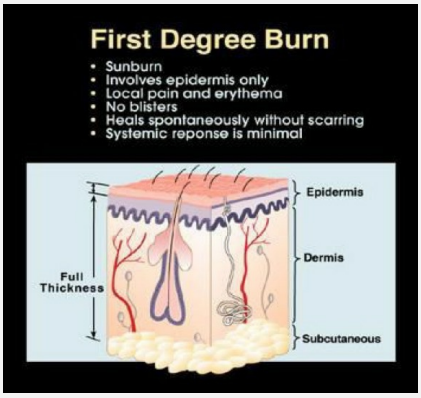
Sensory organ

Epidermis: basic protection
Dermis: blood vessels, nerves, sweat glands
SQ: fatty tissue; can have veins, arteries, & nerves

Burn Injuries

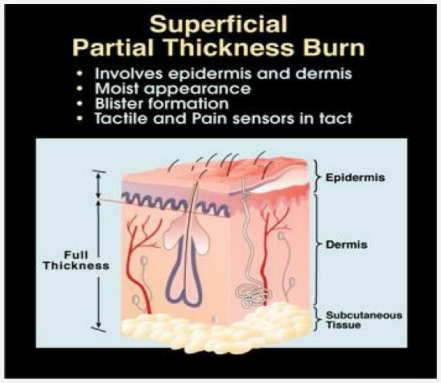
1st degree	(Superficial wounds)
2nd degree	(Partial thickness)
3rd degree	(Full thickness)
4th degree?	(Bone?)

First Degree Burn



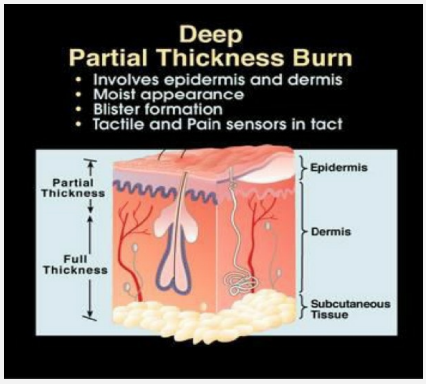
Painful r/t damaged nerves
Warm, blanching effect

Superficial Partial Thickness Burn (Second Degree)



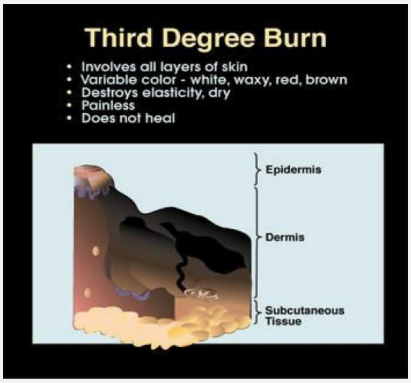
May be shiny, pink, red - blanching?
Scar formation

Deep Partial Thickness Burn (Second Degree)



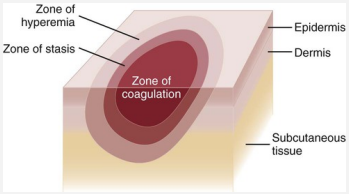
MORE SEVERE, skin grafts may be necessary

Third Degree Burn



May be black, some redness, yellow
Skin grafts (doesn't heal on own)
Eschar needs to be removed
Breathing issues if front &/or back of chest
Cartilaginous areas may not heal as well *(r/t dec. blood supply)*
May have some disability

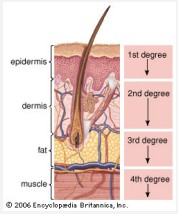
3 Zones of Injury



Zone of coag.: *injury site, tissue necrosis*
Zone of stasis: *inflammatory response = vasoconstriction = tissue may be salvaged*
Zone of hyperemia: *inc. inflammation = vasodilation = inc. blood flow*

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Degrees of Burns



Systemic Response to Burns

All systems are affected

Extent of dysfunction depends on the TBSA involved

Early: **hypofunction → hyperfunction**
- Occurs rapidly
- *Inc. permeability → plasma leaks to interstitial spaces → dec. CO r/t dec. fluid volume (dec. BP) → hyperfunction (compensatory mechanisms)*

Maximal edema occurs in 8-48 hours

Major Burn Event

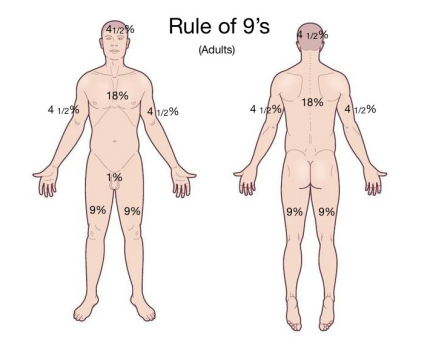
R/t systemic inflammation

Concerns:

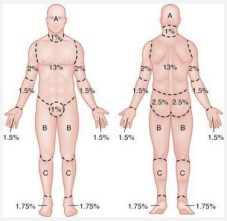
Shock:
- Fluid & electrolyte imbalance
- Temp. regulation
- Pain control (IV)

Infection:
- Reverse isolation *(no plants, fresh fruits/veggies, current immunizations)*
- Temp. regulation (room ~80^{o}F)

Rule of 9's

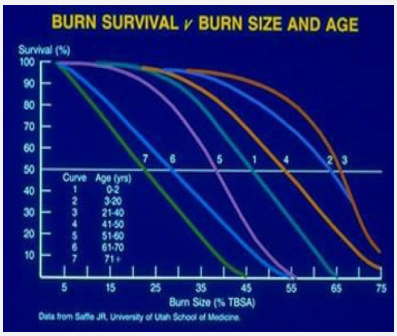


Lund & Browder Classification



* More accurate than the Rule of 9's

Burn Survival & Burn Size



Suvival rate decreases = TBSA increases

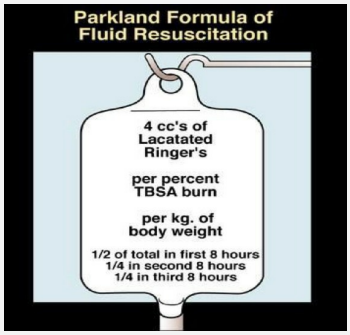
Burn Shock

Leading cause of mortality

Leads to...
- **Hypotension**
- **Tissue hypoxia**
- **Acute renal failure**

It's critical to accurately estimate fluid losses in order to determine replacement!
- Replace using Parkland Formula

Parkland Formula of Fluid Rescuscitation



Lactated Ringer's - corrects Na deficits

Should be started ASAP!

→ 2 PIV's if no central line

→ Give albumin for edema

→ Monitor urine output

Priorities w/ Burn Patients

1. **Stop the burning process**
2. **Airway** - ensure patent
3. **C-spine stabilization**
4. **Breathing** - give 100% O2 or ventilate
5. **Circulation** - assess pulses or CPR

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Stages of Burn Assessment/Care

1. Emergent/Resuscitative Phase
2. Acute Phase
3. Rehabilitative Phase

1. Emergent/Resuscitative Phase

24-48 hours

Point of injury

Fluid resuscitation

Big risk of...
- **Hypovolemic shock**
- Resp. problems
- Compartment syndrome

Acute Phase

48-72 hours/wound starts to heal

Starts w/ diuresis - Ends w/ closure of burn wound

Interventions:
- Reassess ABC's
- Fluid resuscitation
- Urine output (myoglobinuria)
- Circulation (escharotomy)
- Pain control
- Nutritional support
- Focus on wound care
- Prevent infection

Assessment (Immediate Resuscitative Phase)

A	Airway → intubated prophylactically
B	Breathing & ventilation
C	Circulation
D	Deficits (neuro) Deformities Disability
E	Exposure

Rehabilitative Phase

May be years

Begins w/ wound closure - Ends w/ pt at highest level of functioning

Finger injury may not heal correctly → webbing
Psychosocial → therapy
Multidisciplinary care - respiratory therapy, PT/OT, speech therapy, plastic surgery

Wound Care

Debridement
- Surgical, enzymatic
- May be painful → ALWAYS pre-medicate
- Prepare for graft

Dressings
- ~~Gauze~~
- Biologic *(skin, membrane)*
- Synthetic
- Biosynthetic

Skin grafts
- Skin won't heal on its own (full thickness)
- Concerns: circulation, mobilization/ROM, pressure on injury

Pressure garments

Hydrotherapy (cleaning)

Homo-/allografts = humans
Hetero-/xenografts = animals

Protective Barriers

Minor	Solosite *(gel)* Opsite *(clear Tegaderm)*
Superficial	Allevyn Acticoat *(antimicrobial)* Mepillex Silvadene/Bacitracin *(part/full thickness)*
Mid to Deep	Acticoat
Scar Management	Cica Care *(silicone gel sheeting)* Jobskin

Jobskin: *worn to prevent contractures, hypotrophic scar formation*
- Worn 23 hours/day
- Inhibits pooling, venous stasis

Nursing Diagnoses

Risk for infection

Fluid volume deficit

Alteration in...
- Skin integrity
- Tissue perfusion
- Resp. status

Imbalanced nutrition *(weight loss r/t inc. metabolic rate)*

Impaired mobility

Decreased self-esteem

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