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Pathophysiology

Epidermal – 1st degree
- Moderate pain, no blisters, erythema
- Rx: Neosporin ointment
- Injured epidermis peels off; No scar formation

Partial thickness – 2nd degree
- Into but not through dermis
- Vary greatly in appearance
- Extremely painful
- Eschar seperates in 10-14 days
- Deeper burns have necrosis: dry, leathery, waxy white w/o erythema
  - Pain varies
  - Usu heal poorly (scar replaces dermis)
  - Rx: deeper burns req excision and grafting; more superficial ones may be watched

Full thickness – 3rd degree
- All layers of skin destroyed
- Any color: waxy or completely charred
- Circumferential constriction of scar czs ischemia in extremities (may need escharectomy)
- Rx: usu req excision and grafting

Management

Stop the burning; remove clothes, use cool water or moist compresses
#1 killer = CO poisoning; start 100% O2
Watch for airway edema; intubate if req'd
Finish ABCs, start IVF, finish secondary survey

Resuscitation – most important
- Loss of capillary integrity = edema (systemic if > 15% TBSA burned) = Burn shock
- Calculate IVF needs (Parkland formula): 4x(wt)x(%TBSA burned) =24hr LR need
- No colloids b/c injured capillaries are porous to proteins
- Only 2nd/3rd burns count for %TBSA, use rule of 9's
- Give 1st ½ in 1st 8 hours (most edema develops in 1st 8 hours)

Inhalation injury (all three may occur together)

1. CO poisoning
   - Cherry red color, neuro dysfxn, always suspect in unconscious pts
   - Check blood COHb levels
2. Upper airway obstruction
   - Smoke toxins cz mucosal sloughing/edema
   - Pts have singeing of nasal hairs, oral blisters, hoarseness, cough, stridor
   - Rx: O2, pulmonary toilet, early intubation
3. Pulmonary injury
   - Toxins damage bronchioles
   - Rx: same as for airway obstruction

Criteria for referral to burn center

- Any 3rd degree burn
- 2nd degree burns >10% TBSA
- Burns to face, hands, feet, major joints, genitals, perineum
- Inhalation injury, chemical or electrical burn
- Complicated pts – comorbidities, associated trauma, children

Wound coverage

- Pts who attain successful wound closure usu survive
- Early excision best (d/t infxn risk, ongoing inflammation)
- Fascial excision: excise entire skin and subQ tiss to fascia
  - Easy, bloodless, good graft take, but disfiguring and joint stiffness
- Tangential excision: remove sequential thin slices until viable tiss seen
  - Req's skill, bloody, but better function
- Skin grafting best if done at time of excision
- Full thickness grafts: ellipse of skin excised from groin/flank then closed
- Split thickness grafts: very thin skin layer w/ dermis; graft site heals spont in 7-14 d
- If insufficient amount of autograft, may expand w/ mesh or by cutting w/ mult slits
- Meshed autograft covered w/ cadaver allograft to prevent drying

Infection control

- Eschar is ideal medium for bacterial growth
- Burn wound sepsis: highly fatal, previously #1 cz of death (uncommon at burn centers)
- Silver nitrate solution effective against Staph, Strep
- Mafenide acetate (sulfamylon) and silver sulfadizene (silvadene) good for G- bact
- Pseudomonas, MRSA, Acinetobacter, VRE, fungi also relevant
- Early eschar excision + grafting = #1 technique to prevent infxn
- Wash and debride wounds BID
- PNA common and troublesome; systemic inflammatory response occurs

Nutrition

- Burns = the most severe metabolic response seen w/ any illness
- Begin enteral feeds early, w/ hi protein liquid diet (1.5-2gr/kg/day)

Rehab

- Myofibroblasts cause contractures soon after injury
- Begin rehab early, while scar is most flexible
- Tight fitting antiburn scar garments can be used