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Care of the Burn patient

Shriners Children's

Financial Disclosures

I have no relevant financial disclosures.

Source

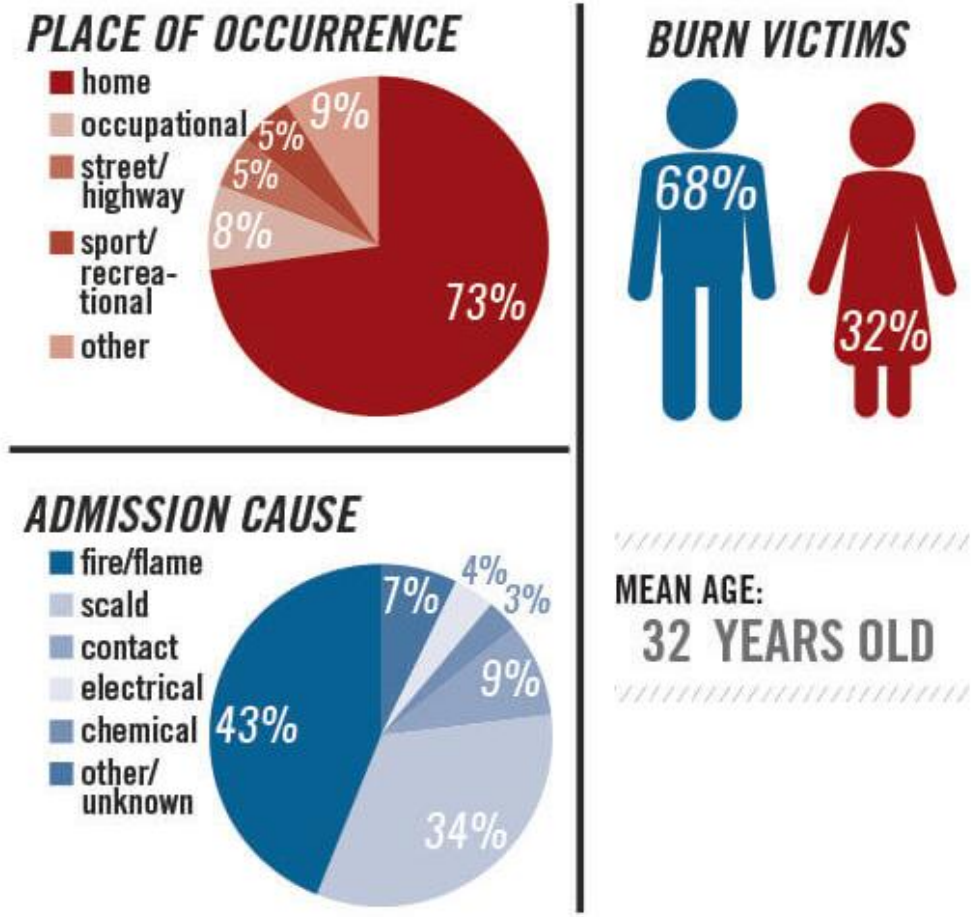
- American Burn Association, Advanced Burn Life Support 2018, 2023

Disturbing pictures and humor

- Please be aware

Burn Demographics

Annually:
450,000 people receive care for burns
45,000 people hospitalized annually for burns
An estimated 4000 people die from burns
Fifth leading cause of death for children



American Burn Association, 2018

Burn Demographics

Almost one-quarter (24%) of all burn injuries occur in children under the age of 15

96.7% of those treated in burn centers will survive. Unfortunately, many survivors will sustain serious scarring and life-long physical disabilities. However, many of the interventions in the first 24 hours can reduce morbidity.

Initial Assessment of the Burn Patient

Primary Survey

- Like that of a trauma patient:
  - Airway
  - Breathing
  - Circulation
  - C-spine immobilization when indicated

Initial Treatment of the Burn Patient

Airway Management

- Administer 100% oxygen to all major burn patients.
  - This is especially important with carbon monoxide poisoning.

- Be prepared to suction the airway and support ventilation as indicated.

- Early tracheal intubation, if indicated, to secure and protect the airway.

2023 ABLS Guidelines for intubation

Indications for e

- Signs of airw respiratory muscle use, sternal
- Extent of the
- Extensive ar
- Burns inside
- Significant e
- Difficulty swa
- Signs of resp , respiratory fatigue, poor
- Decreased le eflexes are impaired
- Anticipated p ithout qualified personnel to intubate en route

Traditional

- Suspected smoke inhalation
- Oropharynx soot
- Hoarseness
- Dysphagia
- Singed facial hair
- Oral edema
- Oral burn
- Non-full thickness facial burn

Initial Assessment of the Burn Patient

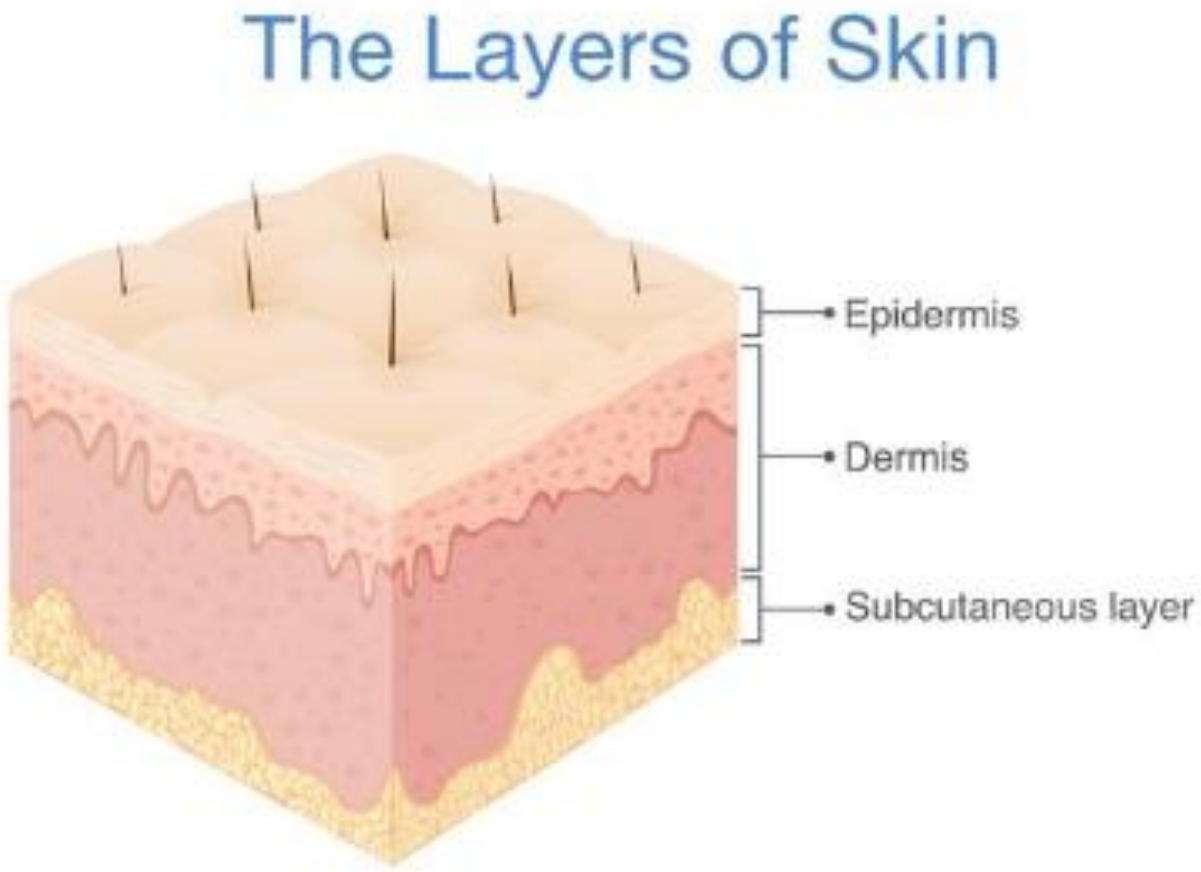
Secondary Survey

- Head to toe assessment to rule out any associated injuries

Special Considerations

- Significant medical history – past and present
- Are blood products accepted?
- If the injury is suspicious, has CPS been notified?
- Significant psycho/social history – past and present

Review of the skin structure related to burn severity



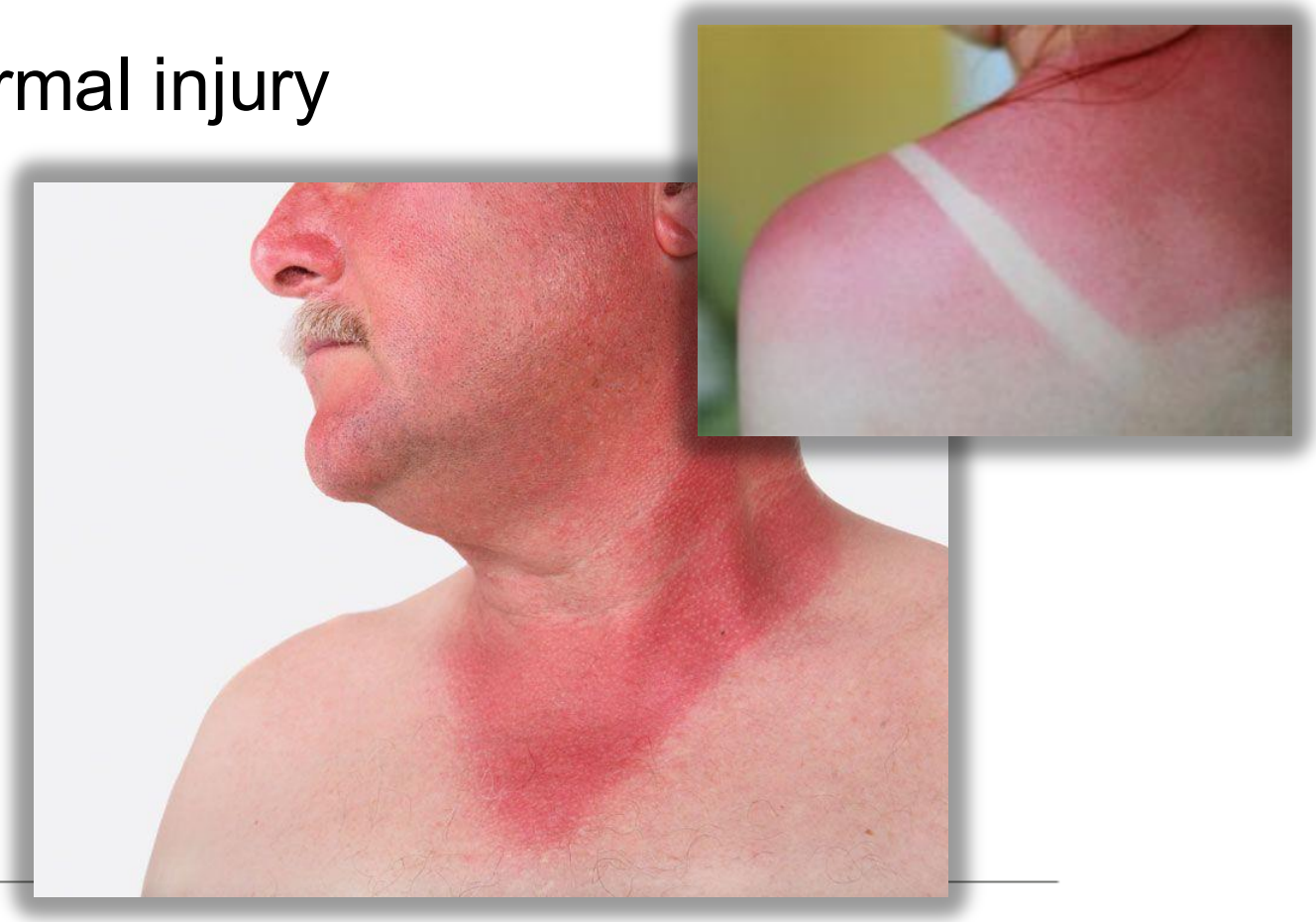
Primary purpose of the skin:

- Protective barrier against injury
- Prevents loss of moisture.
- Acts as a sensory organ
- Helps regulate temperature
- An immune organ to prevent infections
- Production of vitamin D

Assessing the Burn – 1st Degree/Superficial

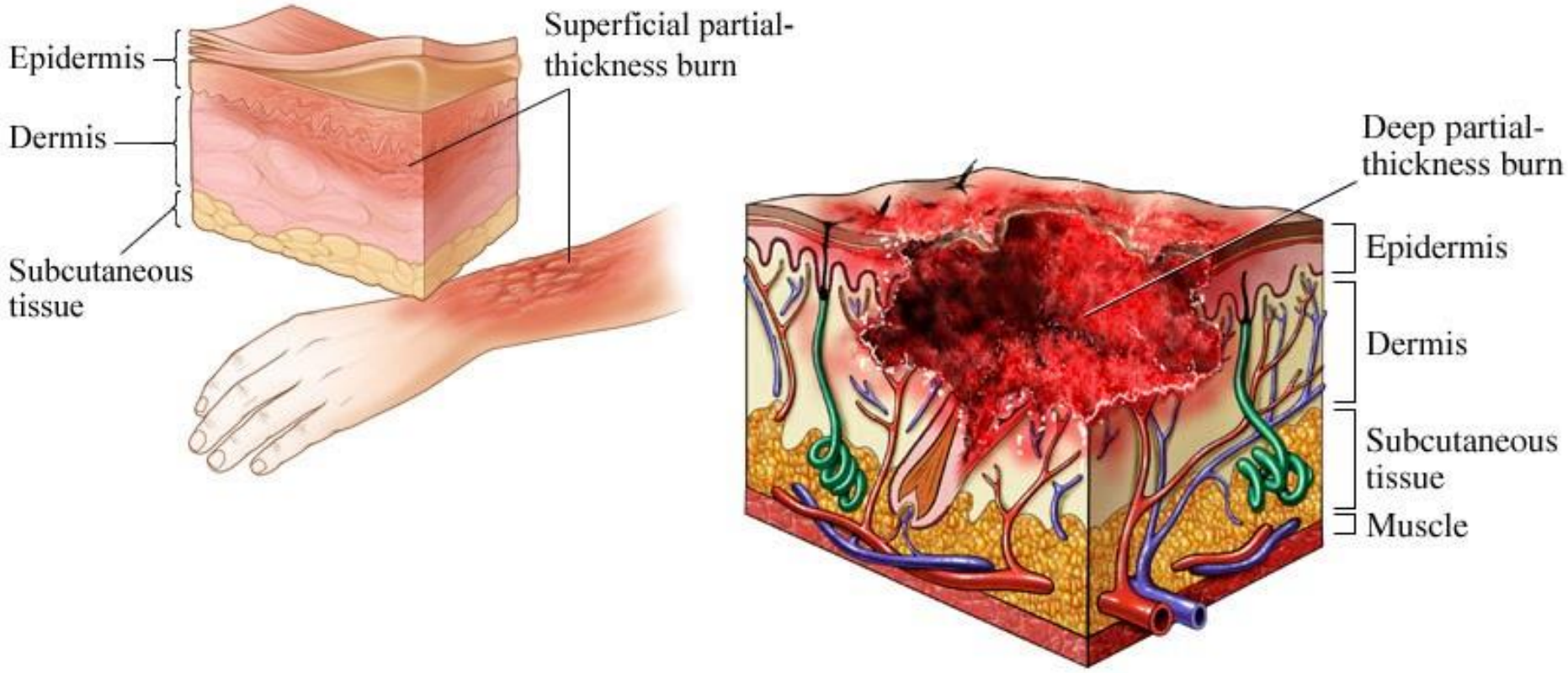
First Degree (Superficial) Burns

- Superficial, epidermal injury
- Usually painful
- Redness
- Swelling



Assessing the Burn – 2nd Degree

Second Degree Burns – Two Types:



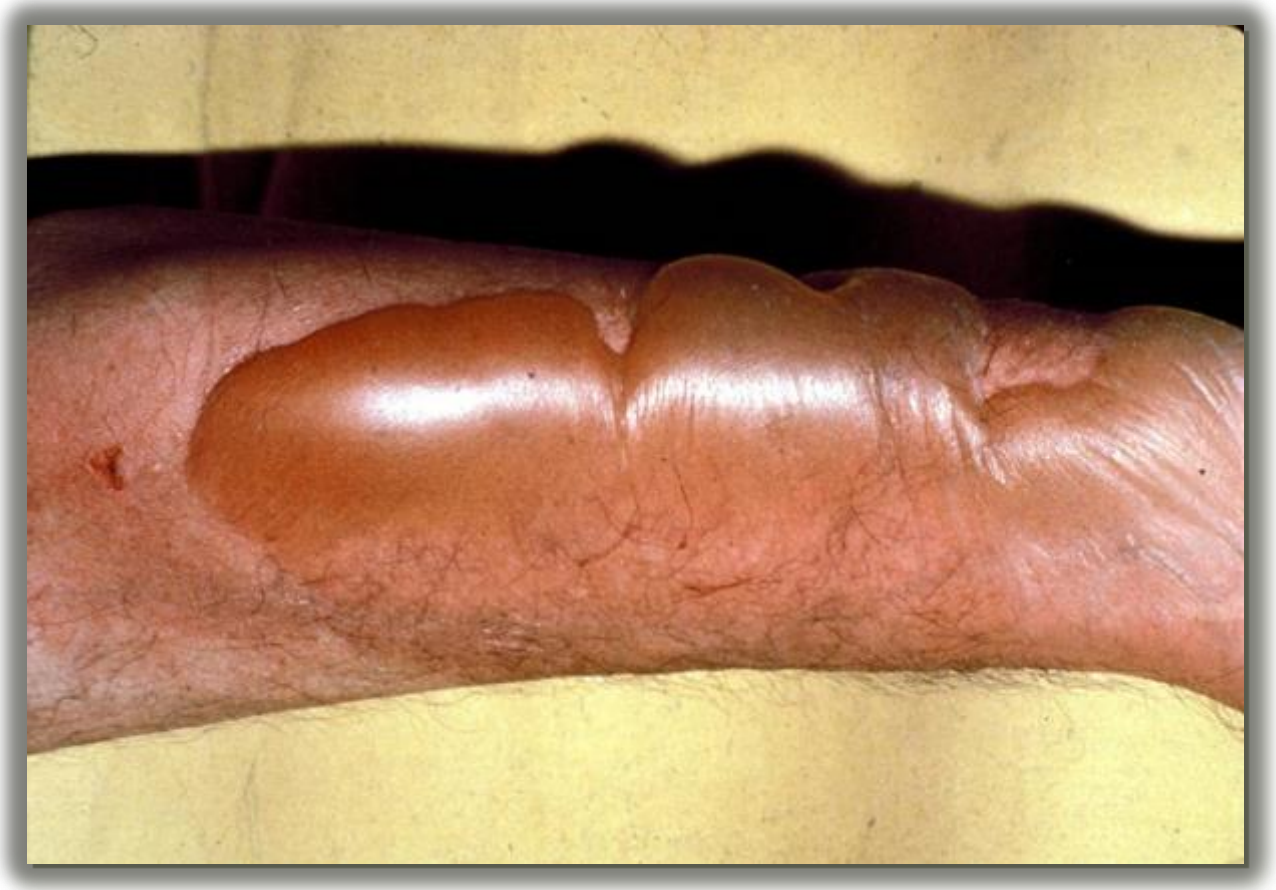
Assessing the Burn – 2nd Degree

Superficial Partial Thickness Burns

- Very painful
- Blisters almost always
- Homogenous pink under the blisters
- Blanches
- Moist
- Doesn’t scar, however it may pigment differently

Assessing the Burn – 2nd Degree

Superficial Partial Thickness Burns



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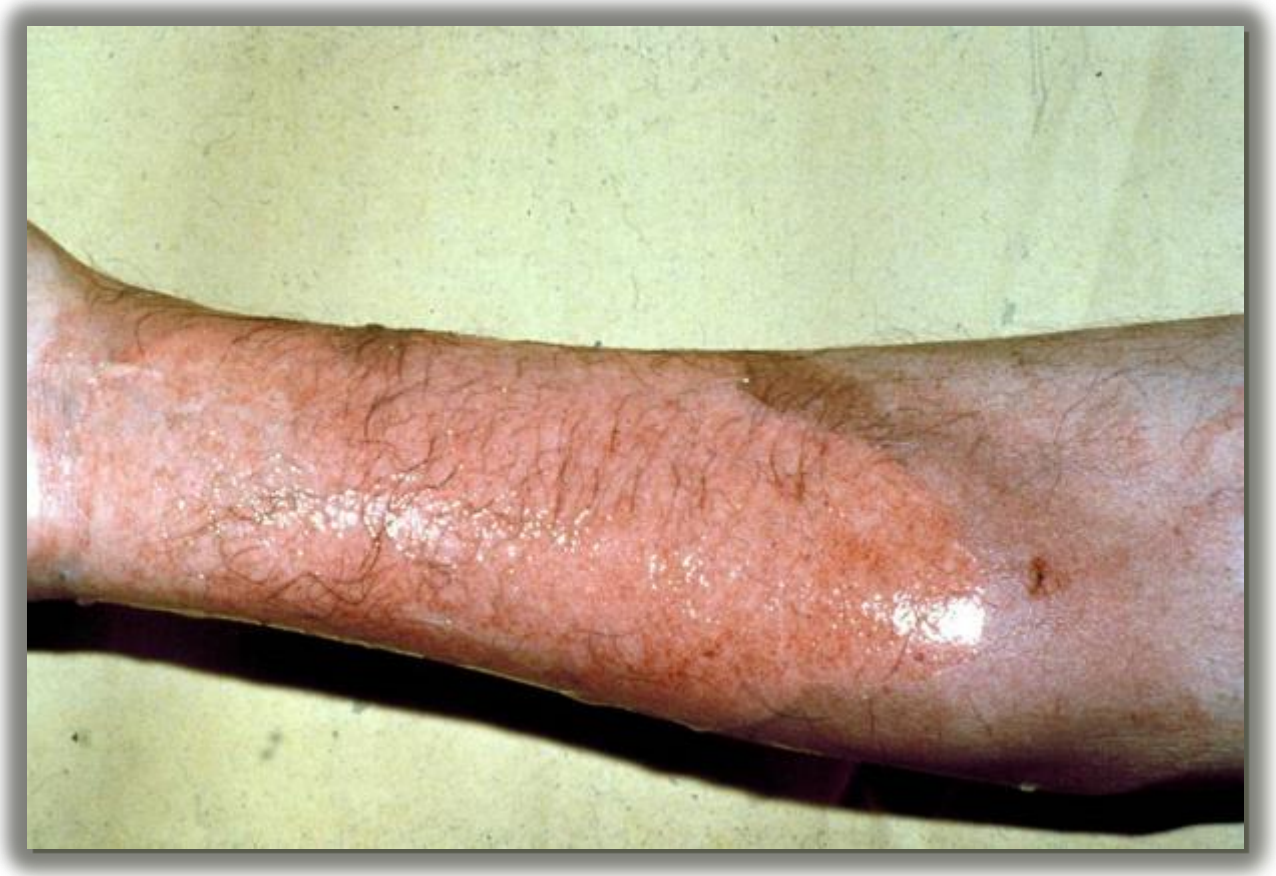
Assessing the Burn – 2nd Degree

Superficial Partial Thickness Burns



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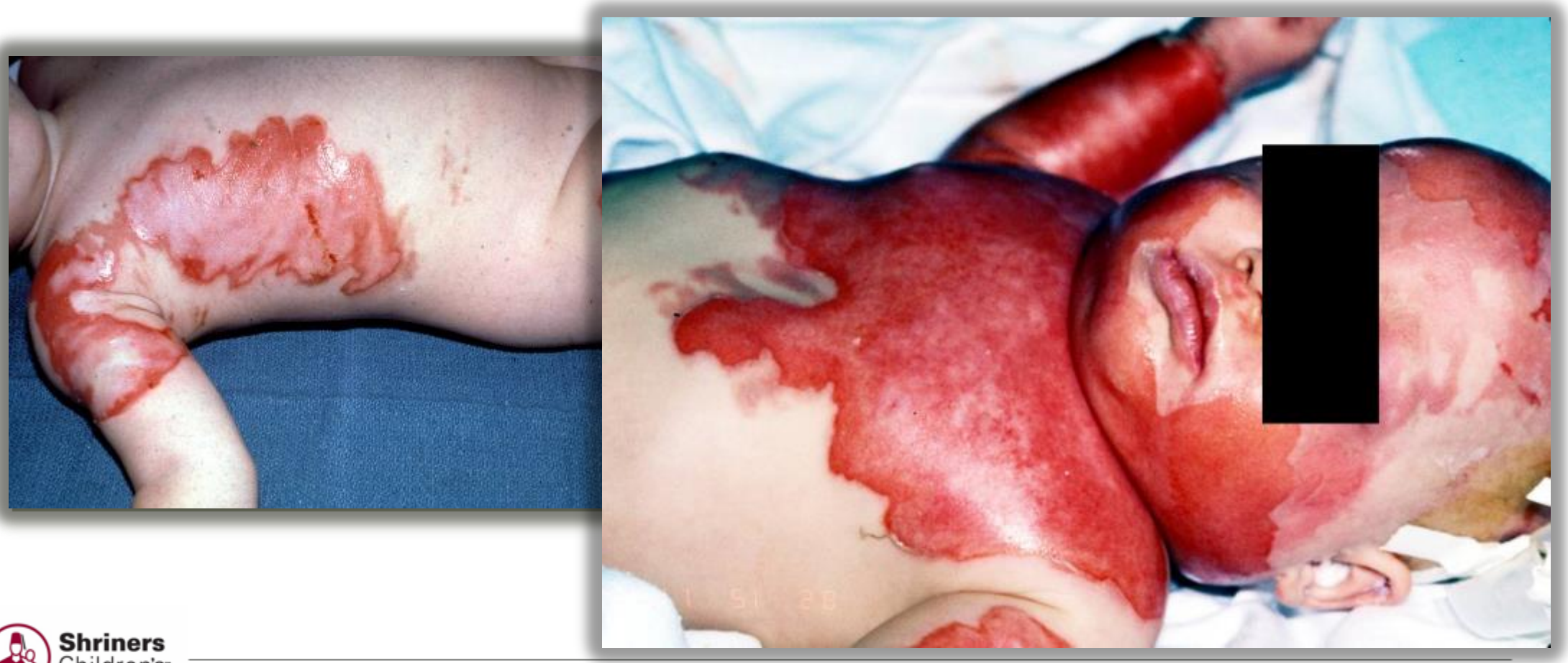
Assessing the Burn – 2nd Degree

Deep Partial Thickness (Deep Dermal) Burns

- Not very painful, reduced sensitivity
- White or a mottled red when cleaned and does not blanch
- Dry instead of moist
- These burn injuries can be difficult to distinguish from full thickness burns
- Usually scars

Assessing the Burn – 2nd Degree

Deep Partial Thickness (Deep Dermal) Burns



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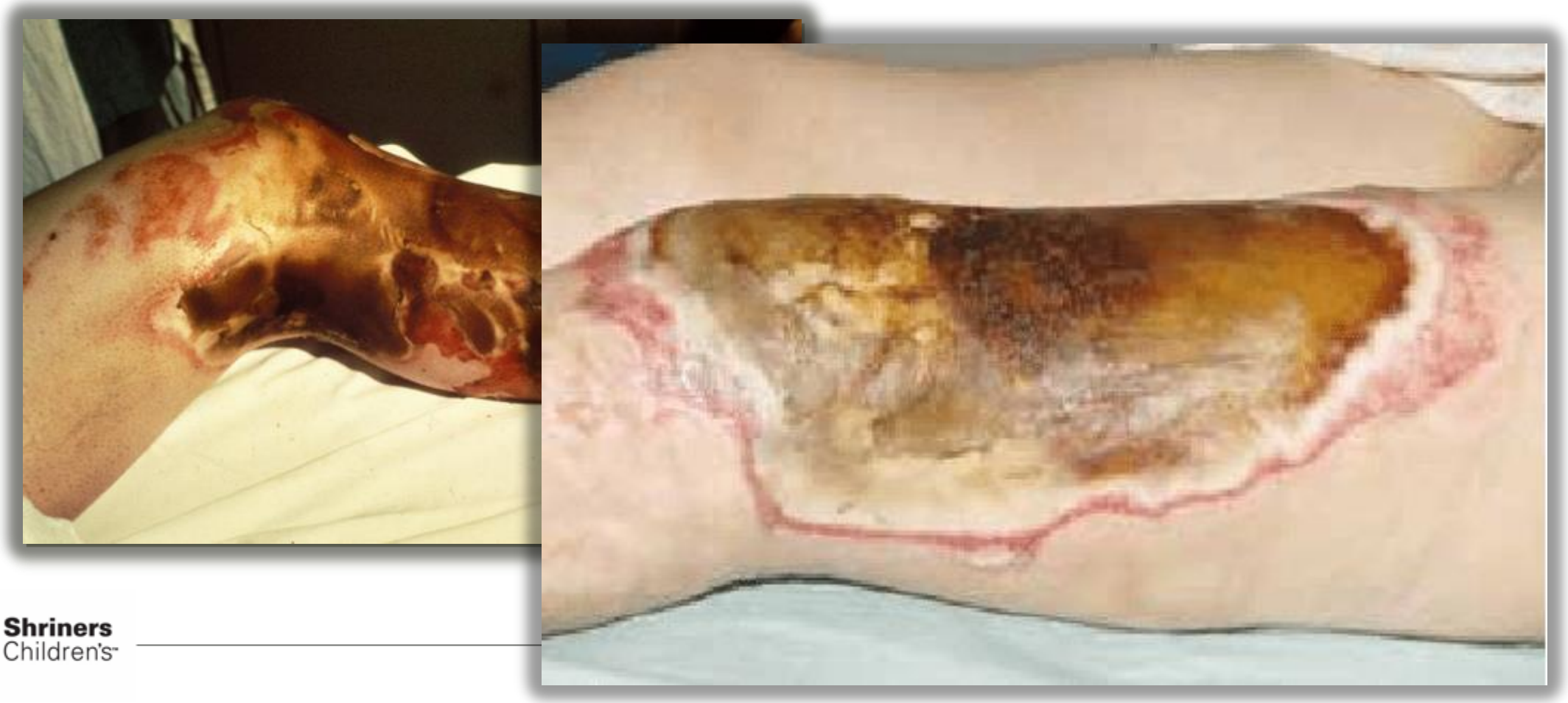
Assessing the Burn – 3rd Degree

Full Thickness Burns

- Extend all the way through the dermis and into the subcutaneous fat
- Diminished sensation – no reaction to pin prick
- Appear white, brown, cherry red or black
- Usually does not have blisters
- Dry, firm, may have leathery appearance

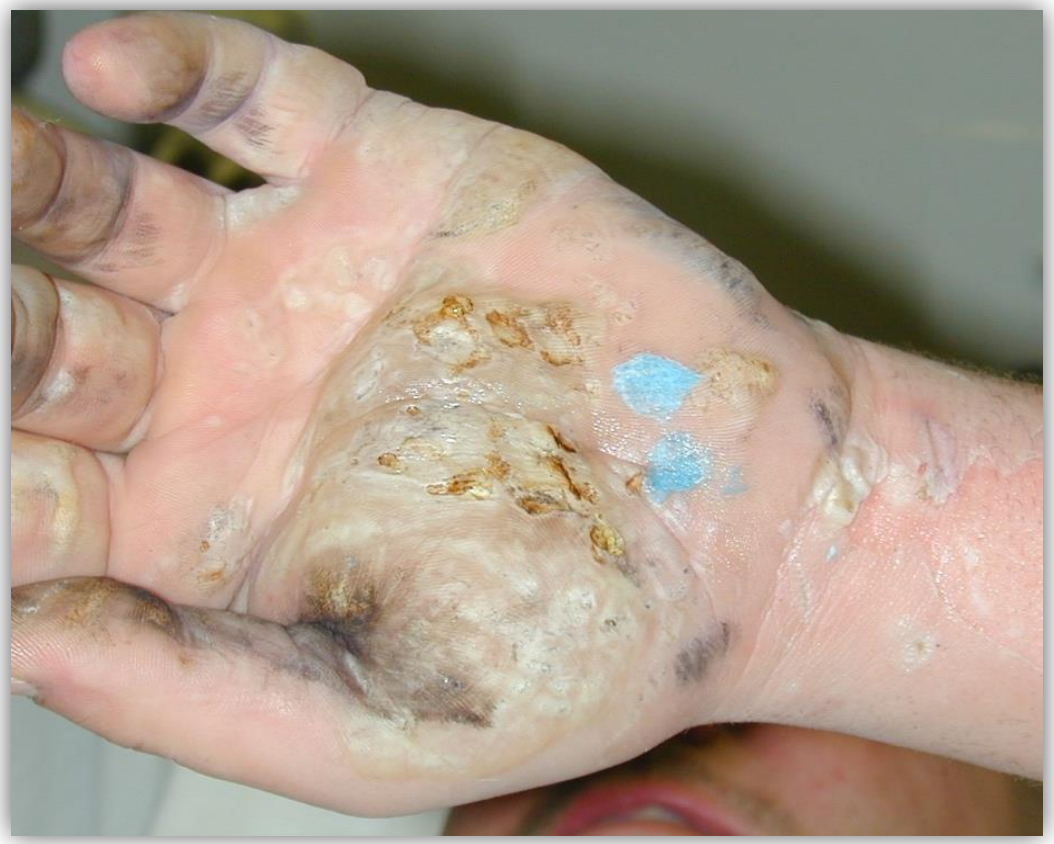
Assessing the Burn – 3rd Degree

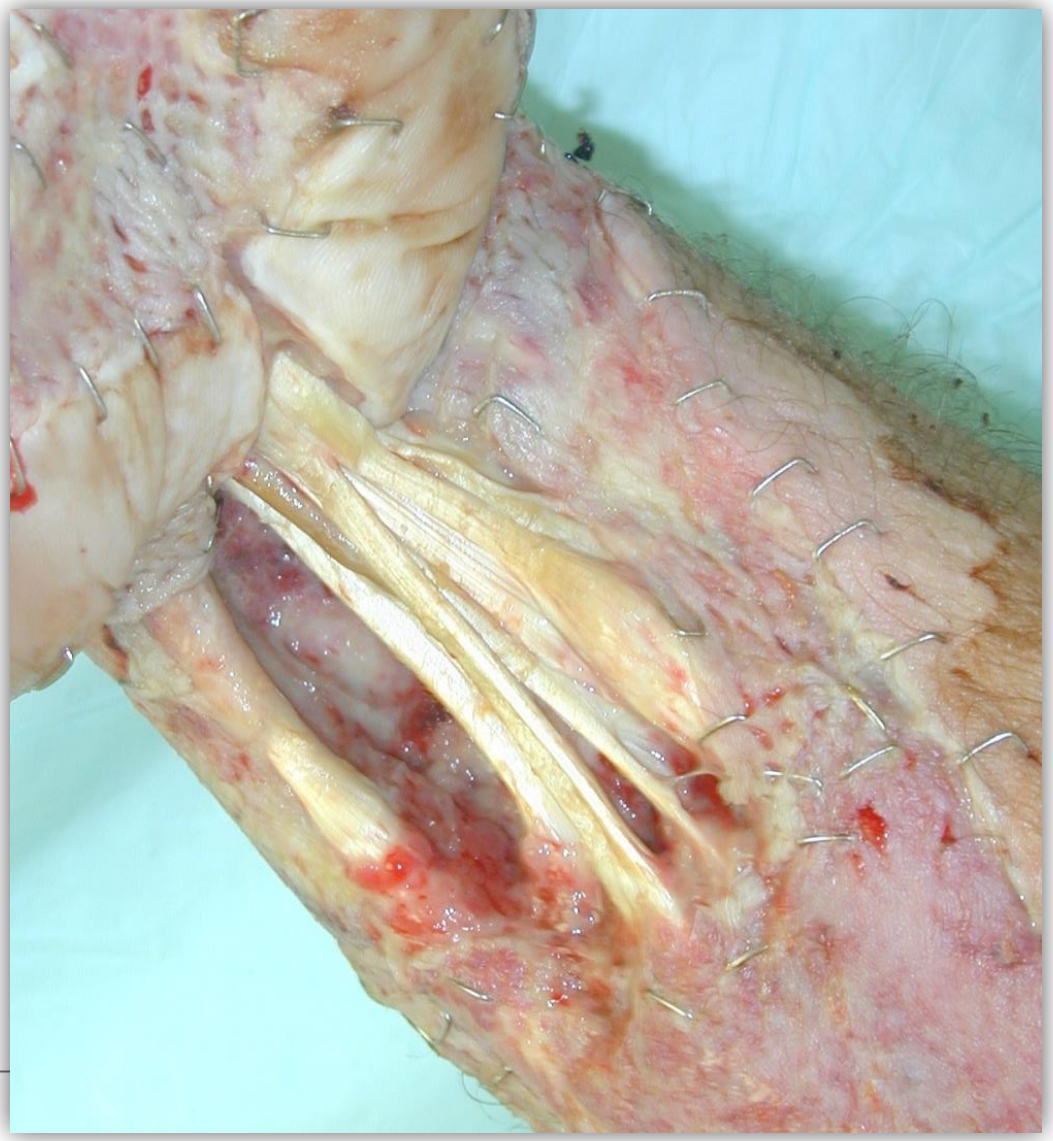
Full Thickness Burns



The Electrical Burn

Electrical: The Iceberg affect





The Electrical Burn

- **The electrical burn is incredibly difficult to treat, as damage is not just to the skin's surface.**
  - Cardiac dysrhythmias, ectopy
  - Fractures (tetany)
  - Kidney failure (myoglobinuria)
  - Progressive neurological changes

The Electrical Burn

Cardiac Monitoring

- Obtain a 12-lead ECG
- Continuous cardiac monitoring is required for dysrhythmias or ectopy
- Treat ventricular fibrillation, asystole, and other life-threatening arrhythmias as outlined by PALS or ACLS.

The Chemical Burn

PPE

- All health care providers must wear a protective gown, gloves, and eye protection prior to patient contact.

- Don’t become a victim.

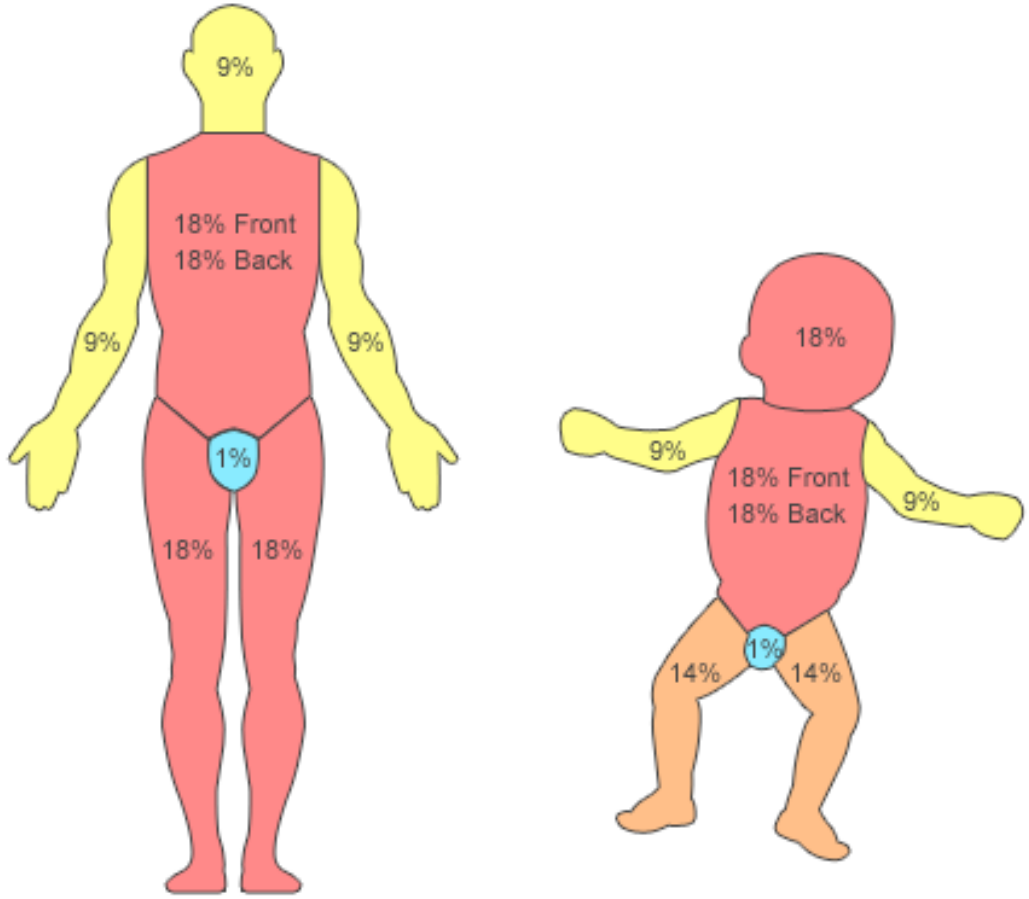
The Chemical Burn

Flushing

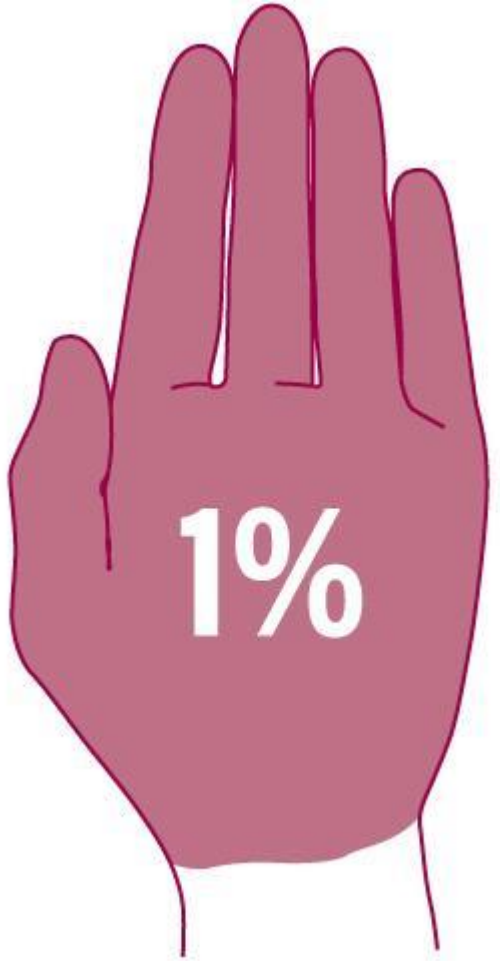
- Chemical burns must be immediately flushed from the body surface with copious amounts of water for 30 minutes to stop the burn.
- Powdered chemicals should be brushed from the skin prior to flushing the body surface area.
- Remove all contaminated clothing.
- Chemical eye injuries require continuous irrigation until instructed by a burn physician.

Calculating Total Burn Surface Area (TBSA)

Wallace Rule of



Palmer Surface



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Patient Stabilization: Fluid Resuscitation

Begin fluid resuscitation for burns >20% TBSA using an appropriate formula

- *Lactated Ringers or D5 + LR?*
  - Adults vs. Pediatrics vs. Infants
  - Children, the elderly, and patients with pre-existing cardiac disease are particularly sensitive to excess fluids.

Insert a urinary catheter

- Monitoring of urine output hourly is essential as it determines fluid rate changes.
- All formulas are only guides.
- 1-1.5 mL/kg/hr of urine output in pediatrics

Patient Stabilization: Fluid Resuscitation

Pre-hospital (initial) fluid rates - Lactated Ringers (LR) fluid of choice

- ≤ 5 yrs. 125ml LR/hour
- 6-13 yrs. 250ml LR/hour
- ≥ 14 yrs. 500ml LR/hour

Definitive fluid resuscitation formula when TBSA and weight (kg) are known

Patient Stabilization: Fluid Resuscitation

Category	Age and Weight	Adjusted Fluid Rate
Flame or scald	Adults and teenagers (≥13 years old)	**2** ml LR × kg × % TBSA = ml/24hrs ÷ 16 = m/hr starting rate
	Children (≤12 years old)	**3** ml LR × kg × % TBSA = ml/24hrs ÷ 16 = m/hr starting rate Plus D_5LR at maintenance rate
Electrical Injury	All ages	**4** ml LR × kg × % TBSA = ml/24hrs ÷ 16 = m/hr starting rate Plus D_5LR at maintenance rate for children ≤12 years old

Patient Stabilization

Regulate the patient's temperature with external forces – hypothermia is common and detrimental to patient outcomes

- Overhead heater, blankets, bear hugger

Maintain hemodynamics utilizing ACLS/PALS guidelines

Apply Burn Blankets, Burn dressings, or clean, dry bulky gauze dressings to burn wounds when transporting the patient – if the dressing is wet, the patient could become hypothermic.

Pain Control

- Morphine or “opioid equivalents”
  - Small frequent doses
  - Most common in practice appears to be fentanyl
- IV only
  - IM poor route due to circulatory compromise
- Larger doses typically required
- Ketamine: NOT addressed in ABLS
  - Existing (recent) literature indicates decreased need for opioids

ABA Transfer Criteria

Patients with burns should be considered for transfer to a burn unit if:

1. Any full thickness (3rd degree) Burns
2. Partial thickness >10%
3. Any partial or full thickness on face, hands, joints, genitals
4. Patients with associated trauma or comorbidities (elderly!)
5. Any inhalation injury
6. Any pediatric burn
7. Chemical burns
8. High voltage electrical injury

ANY OTHER burns that a provider is concerned about can be referred for consultation!

Transporting the Burn Patient

Primary considerations:

- Airway/oxygenation/ventilation always #1
  - Inhalation injury/smoke inhalation/edema
- Fluid resuscitation
  - Keep it simple...
- Temperature regulation
  - Keep the patient WARM!
  - Warm environment/warm fluids/dry covers

Child Abuse – Child Protective Services Referral

As noted by the Texas Family Code, any healthcare provider that **suspects** child abuse **must** report their suspicions to the Texas Department of Family and Protective Services (DFPS) within 48 hours. (Texas Family Code - FAM § 261.101. Persons Required to Report)

- Your report of child abuse or neglect is confidential and **immune from civil or criminal liability** so long as the report is made in good faith and without malice.
  (Texas Family Code - FAM § 261.106. Immunities)

- When in doubt, report!

Thank You!

Shriners Children's™
Texas

PRE-HOSPITAL ASSESSMENT, INTERVENTION, AND TRANSFER IN PEDIATRIC BURN EMERGENCIES

Oct. 22, 2026 | 7:30 AM - 4:30 PM

***Register by October 1, 2026**

Shriners Children's Texas
815 Market St. | Galveston, TX

Shriners Children's™ Texas

*If you would like to register for this event, please contact Vickie Walker at vwalker@shrinenet.org