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Initial Management of the Pediatric Burn Patient

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I have not used artificial intelligence in the development of this presentation.

Objectives

- At the conclusion of this activity, learners will be able to:
  - Appropriately identify various burn injuries
  - Evaluate the pediatric burn patient
  - Plan for initial care of the burn wound
  - Determine when a pt should be transferred to specialized center

US Epidemiology

- Roughly 300 ER visits per day for pediatric burn-related injuries
  - About 600 pediatric deaths/year
- For American Burn Association purposes, pediatric is 13 y/o or younger
- Younger children higher incidence of scald injuries
- Flame injuries more common for older children

Pathophysiology Temperature Regulation

- Greater Body Surface Area (BSA) per kg of body weight
- Less ability to shiver with small muscles
- The younger, the more vulnerable
- Important to warm room and use warm blankets

Pathophysiology Burn Depth

- Thinner skin leads to deeper burns compared to adults

- The higher the temperature and longer duration of contact, naturally the higher the risk

    - Safe bathing water temp is 100 F
    - Temp of 140 F can result in third degree burn in 3 seconds
    - Temp of 120 F can result in third degree burn in 5 minutes

    (recommended water heater setting is 120 F)

Initial Assessment {ABCDE}

- Airway
  - Obstructs more easily due to small size, funnel shape and large occiput
  - Requires less edema to obstruct
  - Endotracheal tube should be cuffed to protect from dislodgement
    - Broselow, child's nares, small finger, formula

- Breathing
  - observe quality of breaths
  - Ensure breath sounds
  - Administer oxygen

Initial Assessment {ABCDE}

- Circulation
  - Monitor BP, HR, skin color
  - IV access options
    - PIV, IO, central
  - Start fluids

Initial Assessment {ABCDE}

- Circulation
  - (if burns clearly exceed 20% TBSA)

Prehospital and initial fluids

5 years and younger	LR 125mL/hr
6-12 years	LR 250mL/hr
13 years and older	LR 500mL/hr

Initial Assessment {ABCDE}

- Disability
  - Assess level of consciousness (hypoxia, hypoglycemia)

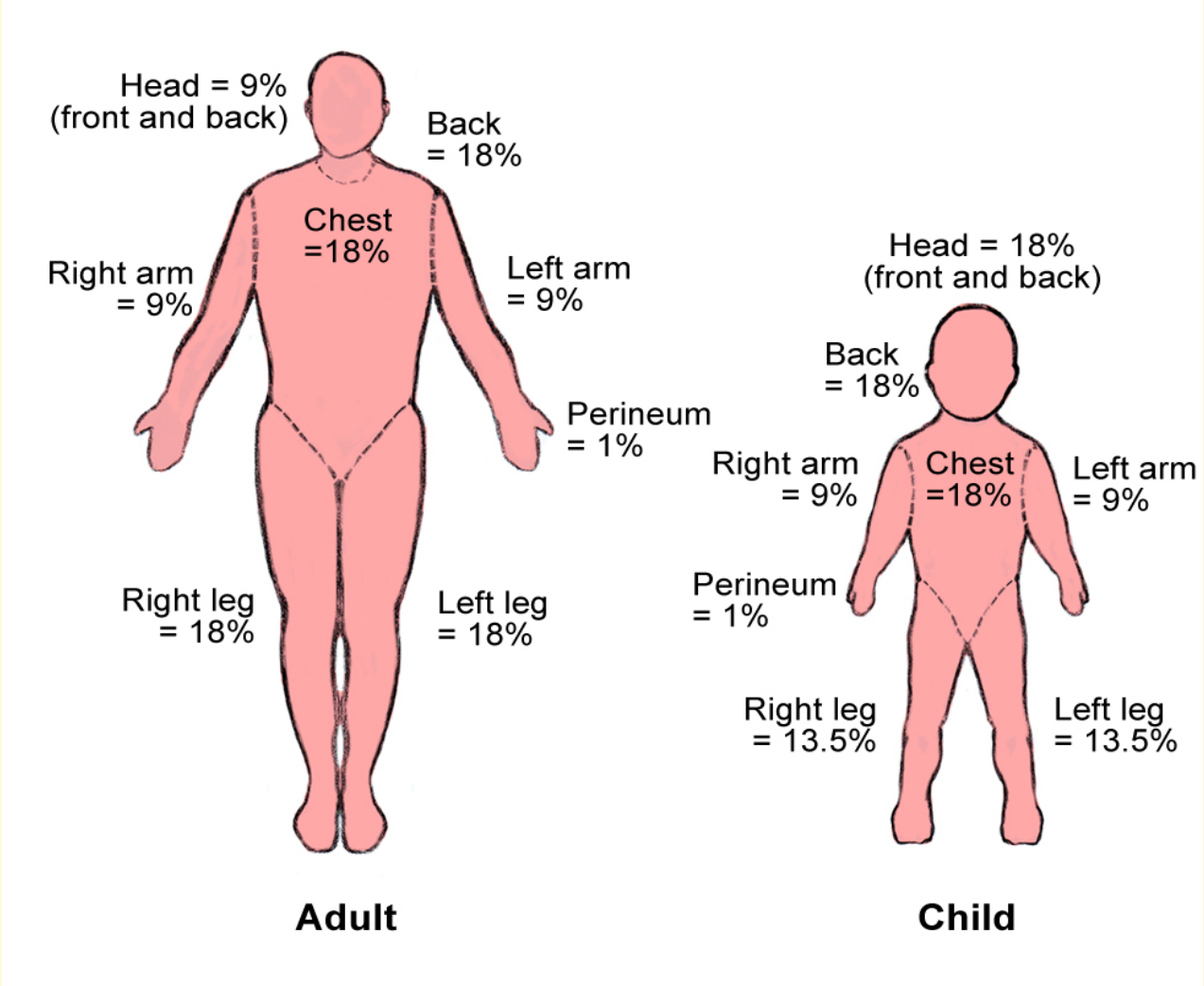
- Exposure and Environment
  - Remove all garments to assess for other injuries
  - Cover with clean dry linen to conserve heat
    - Warm room, warm fluids

Initial Assessment {secondary survey}

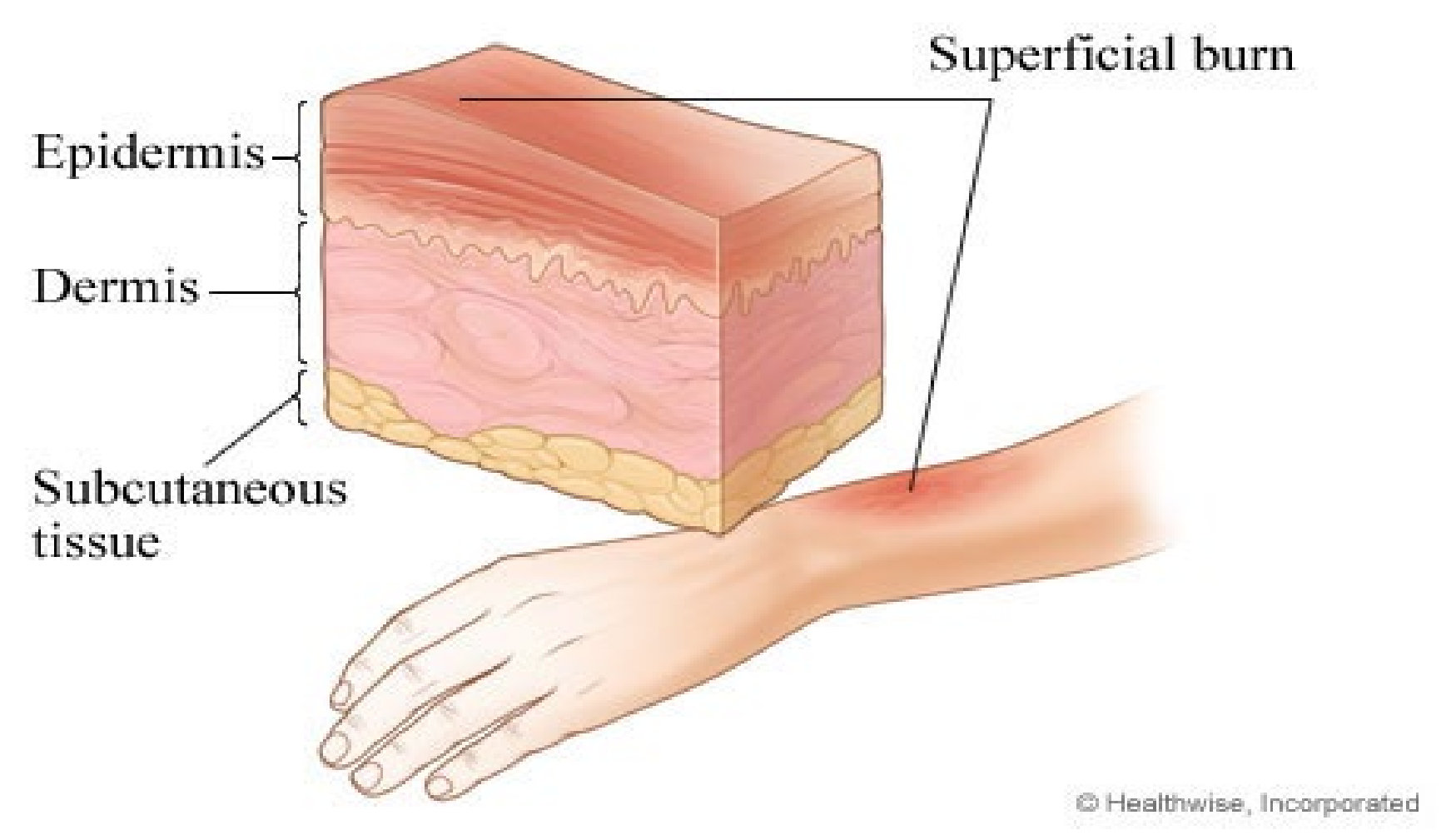
- Head to toe exam, accurate history

- Calculate Body Surface Area (BSA) of burns
  - Rules of 9s, palmar method
  - Only second and third degree burns counted!

Initial Assessment {secondary survey}



Initial Assessment {secondary survey}



Initial Assessment {secondary survey}

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Initial Assessment {secondary survey}

- Begin adjusted fluid rate
- 3mL x kg x %BSA for 13 yrs and younger
- 2mL x kg x %BSA for 14 yrs and older
- 13 years and younger get D5LR as maintenance in addition to adjusted fluid rate (4-2-1 rule)

Initial Assessment {secondary survey}

- Monitoring adequacy of resuscitation
  - Insert foley for burns >20% TBSA
    - Smaller children up to 30kg 1mL/kg/hour urine output
    - Older children > 30kg 0.5mL/kg/hour urine output

- Adjust LR not maintenance fluids for titration.

Initial Assessment {secondary survey}

- Escharotomy for circumferential third degree burns
  - Extremity or torso
  - Rarely needs to be done prior to transfer

Non-Accidental Trauma

- Objective findings not compatible with history
- Story changes
- Story doesn't fit development level
- Sibling blamed

Non-Accidental Trauma

- Caregiver not present at time of injury
- Delay in seeking care
- Passive child
- Associated or old injuries

Burn Center Referral Guidelines

- Partial thickness >10%TBSA
- Any third degree burn
- Deep partial or full thickness burn of
  Face, hands, feet, genitalia, perineum, or over any joints
- Burns with comorbidities or concomitant trauma
- Circumferential burns
- Poorly controlled pain

Burn Center Referral Guidelines

- Inhalational injury suspicion
- Chemical burns
- High voltage electrical injuries

- All pediatric burns may benefit from referral to burn center due to:
  - Pain control
  - Dressing changes
  - Rehabilitation
  - Non-accidental trauma

MOC Questions

- The maintenance fluid of a 20kg child is:
  1. 20mL D5LR/hr
  2. 40mL D5LR/hr
  3. 60mL D5LR/hr **
  4. 80mL D5LR/hr
- A safe setting for water heaters is:
  1. 120 F **
  2. 130 F
  3. 140 F
  4. 150 F

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MOC Questions

- Thinner skin has important implications in burn care because:
  1. It adversely effects the ability to shiver to maintain temperature
  2. Results in deeper burns per contact time compared to adults**
  3. It heals faster in full thickness injuries
  4. It is less susceptible to third degree burns needing escharotomy

Review of Content

- Major airway differences compared to adult
- Impaired ability to maintain temperature
- Thinner skin increase risk for deeper burn

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Review of Content

- Initiate fluid resuscitation immediately
- Add D5LR as maintenance in children <13 y/o
- Be aware of possible abuse or neglect

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References and additional reading

- American Burn Association website at:

  Ameriburn.org

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