Initial Care of the Large Burn Injury Prior to Transfer

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Disclosures

I have no financial disclosures
Pediatric Burn Injury

• 1 child dies every 3 hours

• 1,000,000 burn injuries in US/yr

• Half require hospitalization

• Economic impact
Mechanism

- Hot liquid (Scald) most common
  - One to four years old
- Adolescents more flame injuries
- Non accidental burns
What to Do
Patient Arrives
Initial Management of the Large Burn

Advanced Burn Life Support

EMERGENCY CARE OF THE BURN PATIENT

ATLS®
Advanced Trauma Life Support®

Student Course Manual
Primary Survey

• Airway – Soot in airway, singed nasal hairs, hoarse
• Breathing – Inhalational injury
• Circulation – access, tachycardia, circumferential burn
• Disability – mental status, toxicities
• Environment/Exposure – keep warm
Assessment of a Burn Patient

- Total body surface area (TBSA) burn
- What is the depth
- Circumferential injury
- Mechanism of burn
- Story match the injury
- ?Transfer
Transfer Criteria

- Partial thickness burns > 10% TBSA
- Third degree burns in any age group
- Electrical burns including lightning
- Chemical burns
- Inhalational injury
- Burns that involve sensitive areas such as face, hands, feet, joints, genitalia
- Burns in patients with pre-existing medical conditions
- Multisystem trauma and burn injury
- Social concerns
Key Management Points Prior to Transfer

- Airway management
- Fluid resuscitation
- Wound care
- Pain management
Airway Management
Prior to Transfer
Airway - Pediatric Burn Patient

- Who is at risk
- Multisystem trauma
- Inhalational injury
- Severe/deep facial burns
- Large TBSA burn
Airway - Pediatric Burn Patient

• Is the airway patent?

• Will it be patent in 12 hours?
Airway - Pediatric Burn Patient – 3 Rules

1. You must have a low threshold for intubation
2. You must intubate under ideal conditions (good lighting, equipment, drugs, most expert person available)
3. If you wait, it may be too late
Rule #4 Securing the Endotracheal Tube

- Slit cut in trach tape w/ scissors
- Cloth adhesive tape around ETT
- Trach tape strand A
- Strand B placed through slit in strand A
Secure Airway – Dental Wire
Carbon Monoxide (CO)

- Odorless gas
- 200 times the affinity to bind to hemoglobin compared to oxygen
- Requires special pulse oximeter (carboxyhemoglobin)
- The only treatments are time and oxygen
Is there a benefit to hyperbaric therapy in pediatric CO poisoning from fires?
Carbon Monoxide

Consider:

- Half life of HbCO on 100% oxygen = 80 minutes
- Half life of HbCO on 100% oxygen at 3 atmospheres = 23 minutes
- Elapsed time to
  - contact hyperbaric center
  - resuscitate the patient
  - “package” patient
  - transport patient to hyperbaric chamber: about 1 hour
Carbon Monoxide

Is there a benefit to hyperbaric therapy?

**NO** (unless the chamber is at your facility?)

- It only saves a few minutes
- Safety of transporting the intubated burn patient
- The patient is inaccessible in the hyperbaric chamber
Cyanide Poisoning (CN)

- Gas generated from combustion of synthetic products
- Inhibits cellular oxidative metabolism
- Need to think about it and treat
- Sodium Thiosulfate
- Cyanocobalamin
Key Treatment Concepts

- Children deteriorate faster than adults in terms of upper airway edema
- Repeated intubation attempts may cause edema/obstruction
- Experience in pediatric intubation is needed
- Secure the airway well
- Consider Inhalational injury, CO and CN poisoning
- Do NOT transfer to hyperbaric center
Resuscitation
Prior to Transfer
Establish IV access
Large bore IV’s

Hierarchy for vascular access sites
1. Peripheral IV – unburned skin
2. Peripheral IV – burned skin
3. Intraosseous – unburned skin
4. Intraosseous – burned skin
5. Central line
Initial Resuscitation

- > 20% TBSA burn
- ≤ 5 years = 125 ml/hr LR
- 6 – 13 years = 250 ml/hr LR
- >14 years old = 500 ml/hr LR
- Avoid boluses if possible
Resuscitation

- Many formulas – institution specific
- Modified Parkland Formula with Lactated Ringers
  \[2-4 \text{ ml} \times \text{TBSA} \times \text{weight (kg)} = 24\text{hr fluid requirement (LR)}\]
- TBSA only includes second and third degree burns
- Dextrose containing fluids D5LR at MIV rate (4-2-1 rule)
- Albumin
Variability In Pediatric Burn Resuscitation

• What TBSA burn do you initiate resuscitation for pediatric patients?

• Best formula for resuscitation?

• When do you give maintenance fluid in addition to resuscitative fluid?

• End points of resuscitation?
Pediatric Injury Quality Improvement Collaborative
# Burn Center Specific Guidelines

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Wound Care
Initial Dressing – How to cover the wounds

Do NOT
Initial Dressing – How to cover the wounds

- Clean Dry Dressing
- Prevents Hypothermia
Pain & Anxiety Management
Initial Pain Management

• Pain is typically undertreated
• Anxiety component
• Can lead to increased chronic pain
• Can lead to psychological distress
• First dressing change goes wrong
  they all go wrong
• Give IV not IM
Summary

• Primary survey
• Airway – Inhalational injury – CO/CN poisoning
• Resuscitation – start on a rate
• Dry burn dressing
• Pain control
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