CODE BURN

The First 48 Hours

By

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Ross Tilley Burn Center
Sunnybrook Health Sciences
Objectives: 48 hours Post Injury

- Nurse to ADVOCATE for the burn patients
  - Shatter the Silence

- Aims:
  - A case review
  - Current standard of care
Outline

1. Case Scenario

2. What to do
   - Assessment
     - Primary Survey (ABC)
     - Secondary Survey (Burn)
   - Interventions
     - Fluid Resuscitation
     - Dressing the Burn

3. Transfer
Case Scenario

55♂ presents to emergency room after a ball of flames erupted while attempting to light his barbeque with lighter fluid
Case Scenario

INJURY: burns to the face, upper torso, bilateral arms and left upper leg
Primary Survey

- **COMMON**: Use *ABCDE approach* as with any new trauma
  - A: airway
  - B: breathing
  - C: circulation
  - D: disability
  - E: exposure

- Identify and neutralize any chemical, thermal, or electrical agents which might pose a threat to health care team
Airway and Breathing

- Evaluate upper airway for patency
  - Inhalational injury
  - Stridor or dysphagia
  - Airway compromise
Airway and Breathing

- Evaluate lower airway for comprise
  - Inhalational injury: increase in secretions, bronchospasm, or pulmonary edema

- History of injury reveals special considerations
  - Enclosed vs. open space
  - Risk factor for carbon monoxide poisoning
Airway and Breathing

- Intubation
  - Place largest possible uncut ETT
Airway and Breathing

- Airway monitoring and work up
  - Monitor: breathing and chest wall expansion
  - Comorbidities
  - Carboxyhemoglobin
  - ABG
Circulation

- Prepare for extensive fluid resuscitation
  - 2 large PIVs
  - Central line

- Check all extremities for pulses

- Elevate! Elevate! Elevate!

- Check for circumferential burns
  - Risk: compartment syndrome
  - May require escharotomy

- BP cuff readings may be unreliable
  - Consider arterial line
Secondary Survey: Assess the Burn

- Degree of the Burn
- The Total Body Surface Area (TBSA) affected
First Degree/Superficial

- Layer: the epidermis
- Look: SUNBURN
- Feel: Painful
- Heals: 2-7 days
- NOT calculated in total burn surface area
Second Degree - Partial Thickness

- Layer: epidermis into upper dermis
- Look:
  - Blister/Bullae
  - Bright red/mottled, **moist** and weeping
- Feel: extremely painful
- Healing: 4-6 weeks
Second Degree - Deep Dermal

- Layers: epidermis into the dermis
- Look: **Red with patchy white/yellow area, and typically dry** (usually no blister)
- Feel: Painful
- Heal: up 6 weeks
Third Degree-Full thickness

- Layers: All
- Look: Pale white, charred, red or brown, leathery appearance
  - Surface dry
  - Unblanchable
- Feel: Painless and insensitive
- Heal: surgical excision and debridement

Really no pain?
Total Body Surface Area (TBSA)

- an estimate of the extent of burns which are at least 2nd degree or greater

Palm only, no finger!
Fluid Resuscitation

- Parkland Formula in the **first 24 hours post injury** (ABLS consensus Guidelines, 2011)

- Fluid: Ringer’s Lactate
  - **2-4mL x body weight (kg) x %TBSA**

  - 50% calculated amount 1st 8 hours post injury

  - 25% second 8 hours

  - 25% third 8 hours

<table>
<thead>
<tr>
<th>RATE OF ADMINISTRATION</th>
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<tr>
<td>(2 x kg x %burn) [2nd &amp; 3rd Burn added together]</td>
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<tr>
<td><strong>First 8 hours</strong></td>
</tr>
<tr>
<td>½</td>
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<tr>
<td><strong>Second 8 hours</strong></td>
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<td>1/4</td>
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<tr>
<td><strong>Third 8 hours</strong></td>
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Case Scenario Part 2

- Audience to apply: TALK TO MY HAND!
  - Face
  - Anterior upper torso
  - Both anterior upper limbs
  - Anterior left upper leg

- Apply the formula
  - Total TBSA: 40.5%
  - Weight: 70kg

- Fluid required in first 8 hrs:
  - \( \frac{(2 \text{mL} \times 70\text{kg} \times 40.5\%)}{2} \)
  - = 2.84L in 8 hours
  - = 354cc/hr

RATE OF ADMINISTRATION

\[
\text{RATE OF ADMINISTRATION} = (2 \times \text{kg} \times \% \text{burn}) [2^{\text{nd}} \& 3^{\text{rd}} \text{ Burn added together}]
\]

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<tr>
<th>First 8 hours</th>
<th>Second 8 hours</th>
<th>Third 8 hours</th>
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<td>( \frac{1}{2} )</td>
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Monitoring the Resuscitation

- Guide Fluid Resuscitation: insert a urinary catheter

- Urine output targets
  - Adult Thermal and Chemical burns: 30 - 50 ml urine/hour
  - Adult High Voltage Electrical burns: 75 - 100 ml urine/hour
Fluid Shift and Edema

• Fluid shift and edema formation peaks 24-48hrs post injury

• Fluid mobilization (18-36hrs post injury)

• Fluid resuscitation
  – General/Localized edema
  – 20% weight gain from retained resuscitation fluid
  – Interstitial fluid volume may lead to an ↑ in compartment pressures

  – Pay close attention to circumferential burns and regularly assess CSM and pulse
Analgesia in Burns

UNIVERSAL: inadequate pain treatment

- **Assess**
  - Visual Analogue Scale
  - Numeric Rating Scale
  - Critical Care Pain Observation Tool

- **Non-Pharmacologic**
  - Distraction
  - Guided Imagery
  - Relaxation
  - Virtual Reality

- **Pharmacologic**
  - Opioid analgesics
  - Adjuncts
Dressing The Burn: COMPLICATED?

1. Clean
2. Debride
   - nonviable sloughing tissue.
3. Dress
   - Silver Sulfadiazine-topical antimicrobial agent 4W
4. Wrap
   - wrap the affected area with NS wet to dry gauze and secure with kling. Wrapping distal to proximal
Dressing The Burn: SIMPLE

- **Clean**
  - Clean wound with warm Normal Saline

- **Normal Saline Soaked**
  - Wet to dry dressing
Indications for Transfer

1. Partial thickness >10% TBSA

2. Burns: to face, hands, feet, genitalia, perineum, or major joints.

3. Third degree burns

4. Electrical burns

5. Chemical burns

6. Inhalation injury.
Indications for Transfer (cont’d)

7. Pre-existing medical disorders that complicates management

8. Burn & Trauma (such as fractures)

9. Burned children in hospitals WITHOUT qualified personnel/equipment

10. Burn patients requiring social, emotional, or rehabilitative intervention.

Handout available!!!
Case Scenario

55♂ presents to emergency room after a ball of flames erupted while attempting to light his barbeque with lighter fluid.

INJURY: burns to the face, upper torso, bilateral arms and left upper leg.
# Case Scenario Part 3

**INJURY:** burns to the face, upper torso, bilateral arms and left upper leg

**GOAL:** Stabilize, Monitor and Dress

## What do we need to do or assess?

<table>
<thead>
<tr>
<th>Category</th>
<th>Actions</th>
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<tbody>
<tr>
<td><strong>Airway</strong></td>
<td>- Intubate</td>
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<tr>
<td><strong>Breathing</strong></td>
<td>- Pulse check q1h (U/S doppler) Lines (Arterial and CVL/PIV’s)</td>
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| **Circulation (and lines)** | - VS q1h  
|                     | - temp. q4h                                                             |
| **Fluid**           | - Fluid: Parkland formula  
|                     | - U/O q1h                                                                |
|                     | - CVP q1h                                                                |
| **Dressing**        | - Dress: NS soaked wet to dry                                            |
| **Others**          | - Other  
|                     | - Bladder pressures q4h  
|                     | - NG/OG/Post-pyloric                                                    |
| **Transfer**        | - Bloodwork: lactate, carboxyhemaglobin, and ABG                        |

- Arrangement for transport to burn unit
Achievement

Care of burn patients prior to transfer to the Burn Centre

Main Goal

• Quick Review/Sharing our knowledge with our fellow colleagues

• Break the barrier between Critical Care and “Burn Care”

• Always available, CALL
QUESTIONS?
References