Objectives:

- Identify principal components of primary and secondary surveys
- Be able to apply the “Rule of Nines”
- Distinguish partial vs. full-thickness burns
- State ABA Referral Criteria
Primary Survey

- Airway
- Breathing
- Circulation

- Disability
- Exposure
Airway control:
- Chin lift
- Jaw thrust
- Insert oral pharyngeal airway
- Assess need for ET intubation

Maintain in-line cervical immobilization in patients at risk
Breathing & Ventilation

- Listen: verify breath sounds
- Assess rate & depth
- Administer high flow $O_2$
- Monitor chest wall excursion in presence of deep torso burns
Circulation

- Monitor BP, pulse rate, skin color
- Establish IV access
- Assess circulatory status of circumferentially burned extremities
Disability, Neurologic Deficit

Typically alert & oriented. If not, consider:

- Associated injuries?
- CO poisoning?
- Substance abuse?
- Hypoxia?
- Pre-existing medical condition?

A – Alert
V – Responds to verbal stimuli
P – Responds only to painful stimuli
U - Unresponsive
Exposure / Environmental Control

- Remove all clothing & jewelry
- Maintain patient’s temperature
  - Warm room
  - Keep patient covered; dry sheets, blankets
  - Warm IV fluids
Secondary Survey

- Follows primary survey
- After resuscitation efforts well-established
- Complete head-to-toe evaluation

- History & physical exam
- Radiographic & laboratory studies
Circumstances of Injury: Flame

How did it occur?

- Inside or outside?
- Clothing ignition?
- Time to extinguish flame?
- Extinguished how?
- Gasoline or other fuel involved?
- Explosion? Patient thrown?
Circumstances of Injury: Flame

Structure fire?

- Smoke-filled space?
- How did the patient escape?
  - Did the patient jump?
  - Through glass?
  - From what story?
- Others injured or killed?
- LOC at scene?
Circumstances of Injury: Flame

- Motor vehicle crash?
  - How badly was the car damaged?
  - Car fire?
  - Other injuries?
Are purported circumstances of injury consistent with burn characteristics?

Is abuse or neglect a possibility?
How did the scald occur?

- What was the liquid?
- What was the temperature of the liquid?
  - If tap H₂O, what was heater temperature setting?
  - If heated by other source, was the liquid boiling?
- How much liquid was involved?
- Was the patient wearing clothing?
- If so, how quickly was it removed?
- Was the burned area cooled?
- Was other first aid administered?
Circumstances of Injury: Scald

Is abuse or neglect a possibility?

- Who was with the patient when the scald occurred?
- How quickly was medical care sought?
- Where did the burn occur?

- Are the purported circumstances of the injury consistent with the burn characteristics?
What was the agent?
How did the exposure occur?
What was the duration of contact?
What decontamination took place?
Was there an explosion?
What is the toxicity of the agent?
Circumstances of Injury: Electrical

- What kind of electricity was involved?
- What was the duration of contact?
- Was the patient thrown or did the patient fall?
- What was the estimated voltage?
- Was there loss of consciousness?
- Was CPR administered?
Factors to Consider

- Pre-existing or associated disease
- Medications, ETOH, drugs
- Allergies
- Tetanus status
Medical History

Mnemonic: “Ample”

A - allergies
M - medications
P - past medical hx, illness, pregnancy
L - last meal or drink
E - events / environment related to injury
“Head to Toe” Examination

- Head
- Maxillofacial
- Cervical spine & neck
- Chest
- Abdomen
- Perineum, genitalia
- Back & buttocks
- Musculoskeletal
- Vascular
- Neurological
Determine Burn Severity

- % BSA involved
- Depth of injury
- Age
- Associated / pre-existing disease or illness
- Burns to face, hands, genitalia
Initial Estimate, 2nd & 3rd Degree: “Rule of Nines”

Adult anatomical areas = 9% BSA (or multiple)

- Not accurate for infants / children due to larger BSA of head & smaller BSA of legs.
- Burn diagrams illustrate adult – child differences.
Extent of Burn

Patient’s palmar surface (hand + fingers)
1% TBSA
Factors:

- Temperature
- Duration of contact
- Dermal thickness
- Blood supply

Special Consideration: Very young or elderly patients have thinner skin.
Stabilization Procedures: Pre-hospital or ED

- Stop the burning process
- Universal precautions
- Initiate fluid resuscitation
  - 2-4 ml RL X kg X % BSA burn
    - ½ in 1<sup>st</sup> 8 hrs
    - ¼ in 2<sup>nd</sup> 8 hrs
    - ¼ in 3<sup>rd</sup> 8 hrs
  - See Chapter 3: Shock & Fluid Resuscitation
Management Principles

- Vital signs
- Insert NG tube
- Insert urinary catheter
- Assess extremity perfusion
Management Principles

- Ventilation status
- Pain relief management
- Psychological assessment
Initial Burn Wound Care

Thermal Burns
♦ Cover with clean, dry cloth
♦ No ice or cold water soaks
Electric Injury

- Cutaneous & internal injury
- Consider electrical current cardiac effect
- Cardiac monitoring X 24 hrs
Chemical Burns

- Brush powders from skin
- Flush with copious amounts of water
- Remove contaminated clothing
- Eye irrigation, if involved
- Exposure protection for ED personnel

Initial Burn Wound Care
Initial Laboratory Studies

- Hematocrit
- Electrolytes
- Blood Urea Nitrogen
- Urinalysis
- Chest X-ray
- Arterial Blood Gases
- Carboxyhemoglobin
- ECG (electric injury, Cardiac Hx)
- Blood glucose (pediatrics, diabetics)
Burn Center Characteristics

- Hospital based
- Institutional commitment to burn care
- Medical professionals with burn care expertise
- Acute & rehabilitation services
- Provides educational programs
- Participates in burn care research
- Defined physical location
- Specialized nursing care unit
The ABA identifies the following as injuries requiring a Burn Center referral:

- 2^{nd} degree burns > 10% TBSA
- Burns to face, hands, feet, genitalia, perineum, major joints
- 3^{rd} degree burns
- Electric injury (lightning included)
- Chemical burns
- Inhalation injuries
- Burns accompanied by pre-existing medical conditions
- Burns accompanied by trauma, where burn injury poses greatest risk of morbidity or mortality
- Burns to children in hospitals without pediatric services
- Patients with special social, emotional or rehabilitative needs
Summary

- Recognize a burn injury as potentially serious.
- Be able to assess injuries.
- Be able to develop priority-based plan of care.
- Base care plan on type, extent, degree of burn.
- Know available resources.
- Know how to contact closest, specialized burn care facility.
- Consult with a burn center physician.
- Decide upon local treatment and transport with Burn Center physician.