

PHTLS

Prehospital Trauma Life Support

NINTH EDITION

LESSON 8

Special Considerations

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Lesson Objectives

- Discuss burn assessment and treatment.
- Learn to assess and treat pediatric trauma patients.
- Apply adult trauma treatment concepts to pediatric trauma patients.
- Apply adult trauma treatment concepts to geriatric trauma patients.
- Choose the most appropriate pain management intervention based on clinical findings.

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Case Study 1: Presentation/Dispatch

- One patient
- 2-year-old male
- Second degree burns to the left hand
- Audible stridor present
- Skin cool, pale, and dry



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Scene Size-Up and General Impression

- Scene size-up
 - Law enforcement on scene
 - Caregiver holding patient
- General impression
 - Patient squirming and attempting to escape
 - Visible burn to patient's entire left hand
 - Burn ends at level above wrist

Primary Survey

- Primary survey
 - X—No exsanguinating hemorrhage noted
 - A—Audible stridor present
 - B—Ventilatory rate of 32 breaths/min; clear breath sounds bilaterally
 - C—Rapid pulse rate present; skin cool, pale, and dry
 - D—Pediatric GCS of 10 (E4,V2,M4)
 - E—Burn to the left hand, red in color, wet in appearance, and ending at the level of the wrist. Caregiver has an ice pack applied to the burned hand. Child is shivering.

Discussion (1 of 3)

- How common are burns in pediatric patients?
- Which type of burns are the most common?
- What would lead you to suspect this was an intentionally caused burn injury?



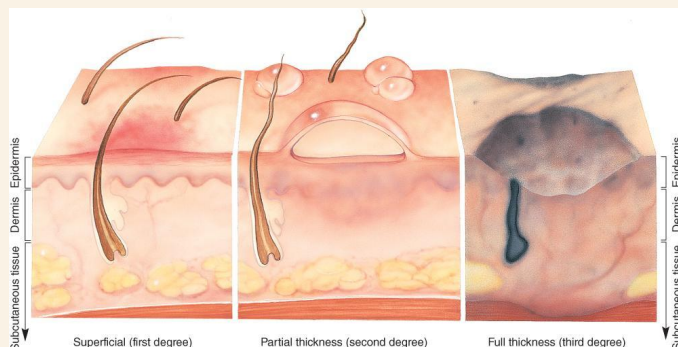
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Discussion (2 of 3)

- What population of patients is at increased risk for burn injuries?
- How do we estimate burn depth?

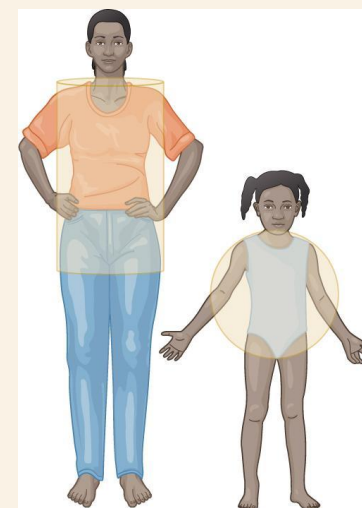


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Discussion (3 of 3)

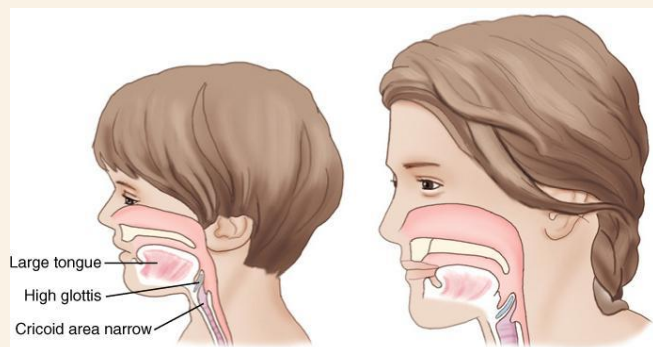
- What are the unique anatomic and physiologic characteristics of this patient that are of concern?



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Pediatric Anatomy

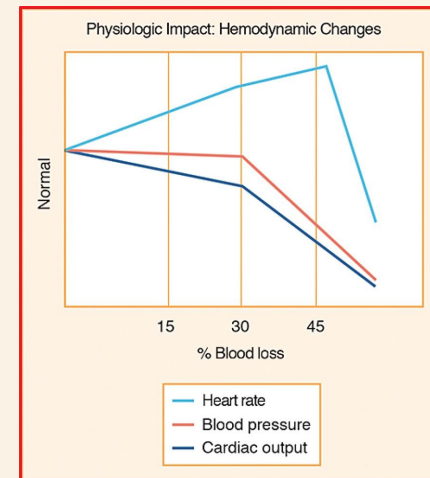


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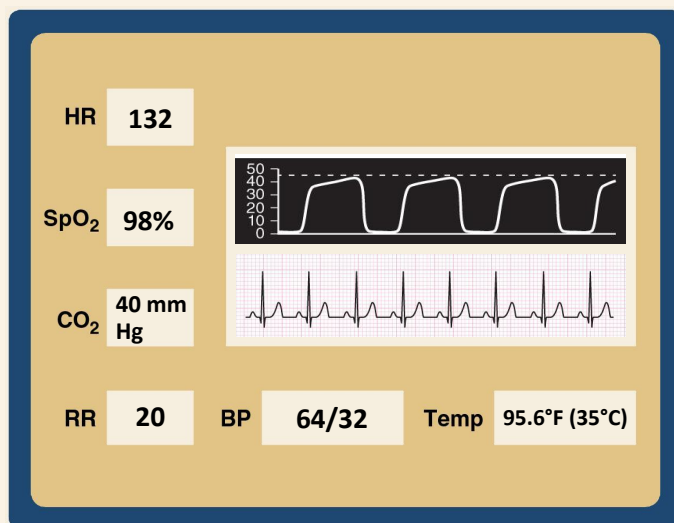
Pediatric Patients and Shock

- Shock
 - Most pediatric injuries do not cause immediate exsanguination.
 - Blood pressure is a poor indicator of blood loss and peripheral perfusion.
 - Children remain in compensated shock longer than adults, but decline very rapidly.



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Secondary Survey



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Case Progression

- X—None
- A—Intubate for airway control.
- B—Place patient on 100% humidified oxygen via bag-mask device.
- C—Elevate the burned extremity.
- D—None
- E—Expose the patient to make sure there are no other burns. Stop the burning process if still present.

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Discussion

- Is advanced airway management indicated for this patient?
- What physical assessment finding indicates the potential for respiratory compromise?

Pediatric Glasgow Coma Scale

Pediatric Glasgow Coma Scale (GCS)

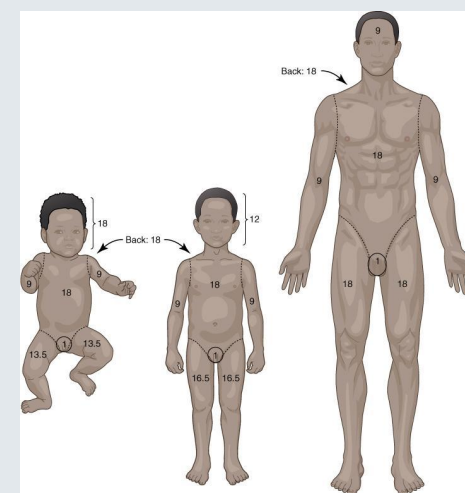
Activity	Score	Infant	Score	Child
Eye opening	4	Open spontaneously	4	Open spontaneously
	3	Open to speech or sound	3	Open to speech
	2	Open to painful stimuli	2	Open to painful stimuli
	1	No response	1	No response
Verbal	5	Coos, babbles	5	Oriented conversation
	4	Irritable cry	4	Confused conversation
	3	Cries to pain	3	Cries
				Inappropriate words
	2	Moans to pain	2	Moans
	1	No response	1	Incomprehensible words/sounds No response
Motor	6	Normal spontaneous movement	6	Obeys verbal commands
	5	Localizes pain	5	Localizes pain
	4	Withdraws to pain	4	Withdraws to pain
	3	Abnormal flexion (decorticate)	3	Abnormal flexion (decorticate)
	2	Abnormal extension (decerebrate)	2	Abnormal extension (decerebrate)
	1	No response (flaccid)	1	No response (flaccid)

Management Options

- Based on what we know about the patient, what are our management options?

Discussion (1 of 6)

- What percentage of body area has been burned?
- What assessment methods are available to evaluate burn size in the prehospital setting?



Discussion (2 of 6)

- What are the initial actions a prehospital care provider should take when managing a burn injury?
- How should the prehospital care provider manage blisters from burn injuries?



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Discussion (3 of 6)

- What tool would you use to guide fluid resuscitation of a burn patient?
- How is fluid resuscitation modified for pediatric patients?
- What is the Rule of Ten for burn resuscitation?

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Discussion (4 of 6)

- Parkland formula: total fluid in first 24 hours = $4 \text{ ml} \times \text{body weight in kg} \times \% \text{ BSA burned}$
 - Half of total fluid should be given in the first 8 hours after burn.
 - Second half of total fluid should be given in the next 16 hours after burn.
 - Adults receive lactated Ringer's.
 - Pediatric patients (weighing less than 20 kg) receive 5% dextrose in lactated Ringer's.

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Discussion (5 of 6)

- What are your options for pain management?
- What are the benefits to providing analgesia?
- What is the most appropriate analgesia for this patient?

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Discussion (6 of 6)

- What is the most appropriate transport disposition for this patient?



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Case 1 Summary

- Secondary survey is performed during transport.
- No additional injuries noted.
- Patient is transported by ambulance to a designated burn center.
- The patient is discharged to home following several successful skin grafts.
- The incident was reported to Child Protective Services for follow-up.

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Critical Actions

- Pediatric assessment to identify potential life threats
- Determination of best method to manage this patient
- Reassessment of airway and burns after management is completed

Case Study 2: Presentation/Dispatch

- One patient
- 83-year-old male
- Vehicle versus telephone pole
 - Patient complains of feeling "weak."



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Scene Size-Up and General Impression

- Scene size-up
 - Law enforcement on scene
 - No skid marks on roadway
 - Front end of the vehicle damaged
 - No intrusion into patient compartment
- General impression
 - Patient talking with law enforcement officer

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Primary Survey

- Primary survey
 - X—No exsanguinating hemorrhage noted
 - A—The patient is speaking in full sentences.
 - B—Ventilatory rate of 24 breaths/min; clear breath sounds bilaterally
 - C—Radial pulse present with normal rate; skin cool, pale, and dry
 - D—GCS of 15; pupils equal, round, and reactive
 - E—No injuries noted; no significant environmental factors

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Discussion (1 of 3)

- Why might this patient be at an increased risk for sustaining trauma?
- What preexisting conditions affect geriatric trauma patients?



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Discussion (2 of 3)

- What anatomic and physiologic changes associated with aging affect the airway in trauma patients?
- What anatomic and physiologic changes associated with aging affect the respiratory system in trauma patients?
- What anatomic and physiologic changes associated with aging affect the cardiovascular system in trauma patients?

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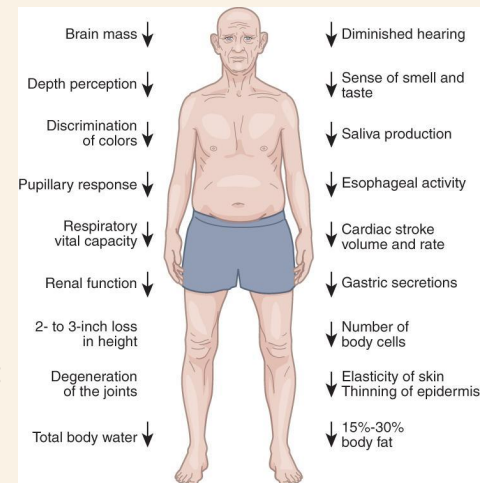
Discussion (3 of 3)

- What anatomic and physiologic changes associated with aging affect the nervous system in trauma patients?
- Does this impact the ability of the geriatric patient to sense pain?

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Effects of Aging on the Body

- The body gradually loses its ability to maintain homeostasis.
 - Preexisting conditions can increase mortality from less severe injuries.
 - Malnourishment is common.
 - Geriatric patients may have:
 - Slower cognitive responses
 - Degenerative diseases
 - Decline in sensory acuity



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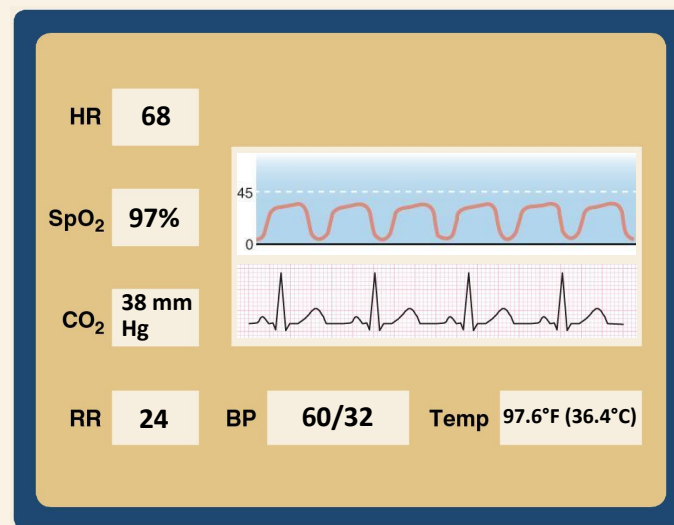
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Case Progression

- X—None
- A—Patent
- B—Place the patient on 100% oxygen.
- C—Radial pulse present
- D—No concerns; GCS 15
- E—Keep the patient warm.

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Secondary Survey (1 of 2)



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Secondary Survey (2 of 2)

- Secondary survey is performed.
 - Pertinent history
 - No allergies
 - Currently taking 40 mg of labetalol daily
 - Past history of hypertension

Management Options

- Based on what we know about the patient, what are our management options?

Case 2 Summary

- Secondary survey completed en route.
- Transport to a designated trauma center
- En route, the patient's blood pressure increased to 80/50 mm Hg after 400 mL of normal saline.
- At the trauma center, patient is admitted to the ICU for 3 days.
- Patient is discharged to home following an admission for a mild liver laceration.

Critical Actions

- Geriatric assessment to identify potential life threats
- Determination of best method to manage this patient
- Reassessment of patient management is completed.

Case Study 3: Presentation/Dispatch

- One patient
- 29-year-old pregnant female
- Laceration to the left arm following a fall



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Scene Size-Up and General Impression

- Scene size-up
 - Patient meets you at front door
 - Patient attempting to control the bleeding from arm with a kitchen towel
- General impression
 - Significant bleeding from a laceration to left forearm

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Primary Survey

- Primary survey
 - X—Bleeding from the left forearm partially controlled with a towel
 - A—Patent and self maintained
 - B—Ventilatory rate of 20 breaths/min; clear breath sounds bilaterally
 - C—Rapid pulse rate present; skin warm, pink, and dry
 - D—GCS of 15; pupils equal, round, and reactive
 - E—Laceration of approximately 3 in. (7 cm) to the left forearm

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Discussion

- What physiologic changes occur in obstetric patients predisposing them to trauma?



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Case Progression

- X—Control bleeding with wound packing
- A—Patent
- B—20 breaths/min; clear
- C—Rapid pulse
- D—GCS 15
- E— Laceration controlled with wound packing

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Management Options

- Based on what we know about the patient, what are the management options?



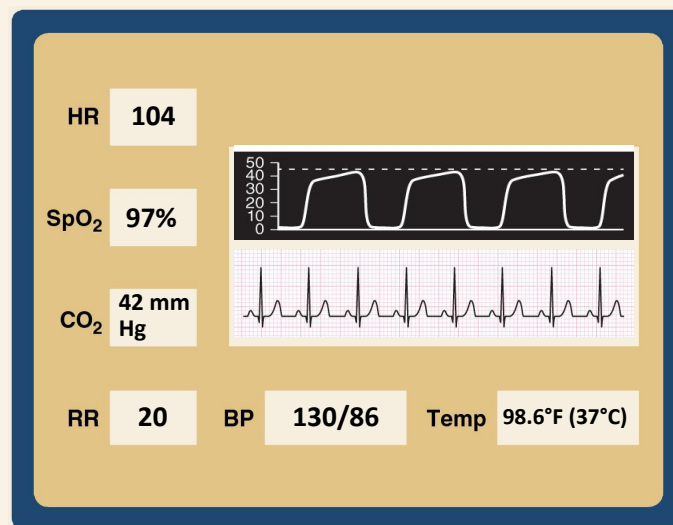
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Discussion

- How would you transport this patient?

Secondary Survey



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Case 3 Summary

- Secondary survey completed during transport.
- The patient is transported by ambulance to a designated trauma center.
- The patient is discharged to home following closure of the wound and a consult from the OB/GYN.

Critical Actions

- Obstetric assessment to identify potential life threats
- Determination of best method to manage this patient
- Reassessment of patient management is completed.

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Wrap-Up

- Pediatric, geriatric, and pregnant patients possess unique anatomic and physiologic characteristics.
- Pain management is an important aspect of prehospital care, and the prehospital care provider must use good clinical judgment in determining the most appropriate analgesic medication to administer.
- Patients with certain types of burns require specialized definitive care offered at a designated burn center.
- Geriatric patients' underlying medical conditions may pose a concern in care rendered.
- Understanding physiologic changes in obstetric patients will guide appropriate care.

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