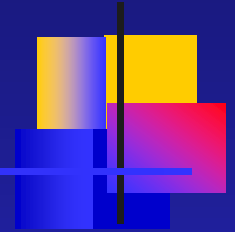




Emergency Medicine and Trauma Care Research Center



Pediatric Trauma

Professor Dr. Samad Shams Vahdati

Emergency medicine specialist

&

Neurovascular emergency fellowship



Objectives

- **Identify unique characteristics of the pediatric trauma patient**
- **Identify injury patterns in children**
- **Discuss application of ATLS management principles to the injured child**



Key Questions

- **What type of injuries do children sustain?**
- **What aspects of childhood anatomy do I need to consider?**
- **What physiologic differences will impact on my management?**
- **How do I apply the ATLS principles to the child?**
- **How do I recognize abuse injuries?**

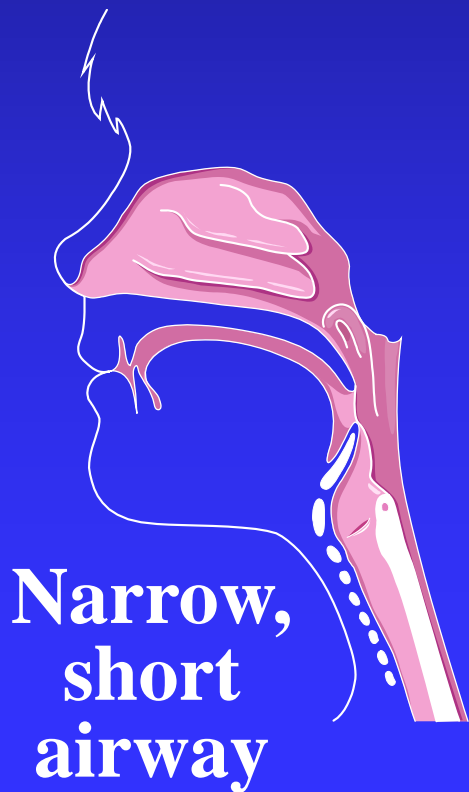


Type of injuries sustained?

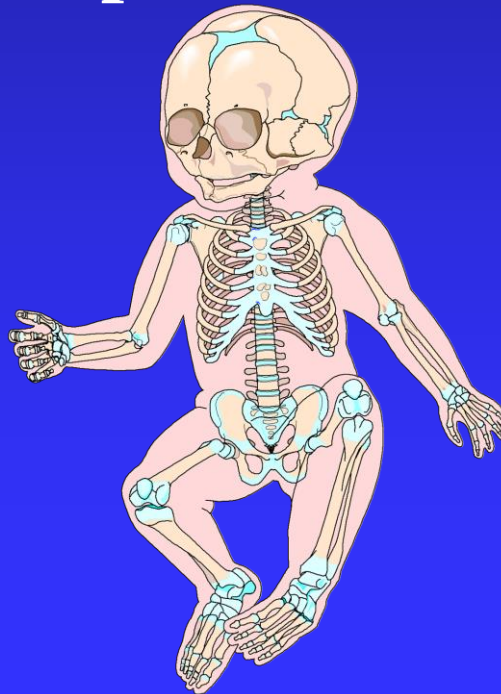
- **Age-related mechanism of injury**
- **Injury mortality surpasses all other diseases**
- **Mechanisms and patterns of injury**

Anatomic considerations?

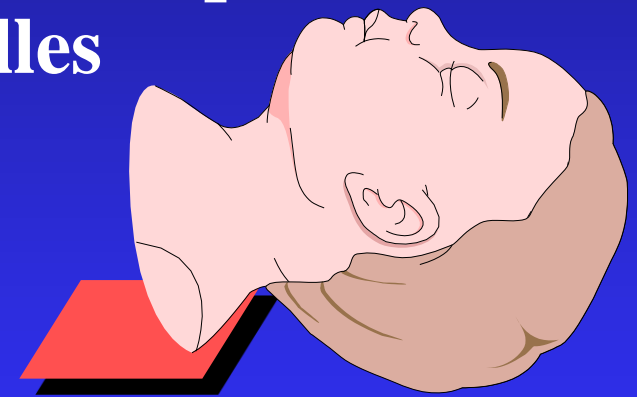
Airway, Head, and Neck



Open fontanelles

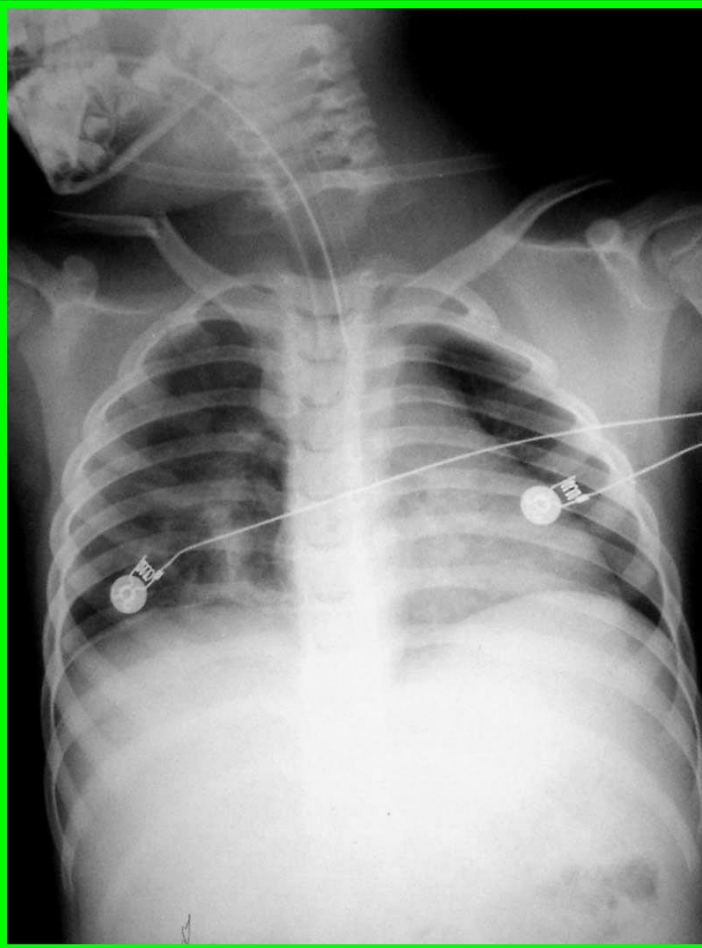


Neutral position



Pad under torso

Anatomic Considerations?

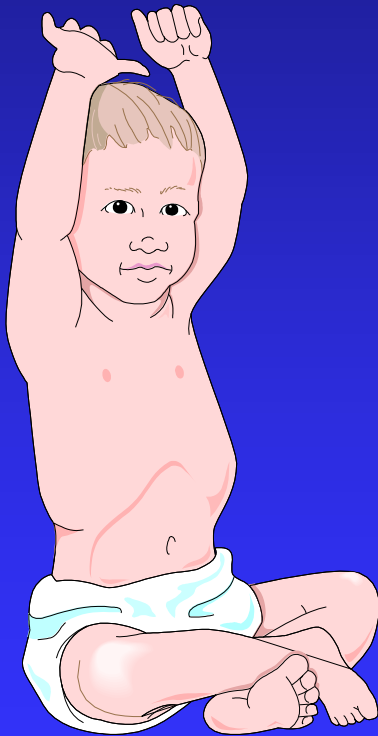


Chest

- Pliable, soft wall
- Chest injuries poorly tolerated



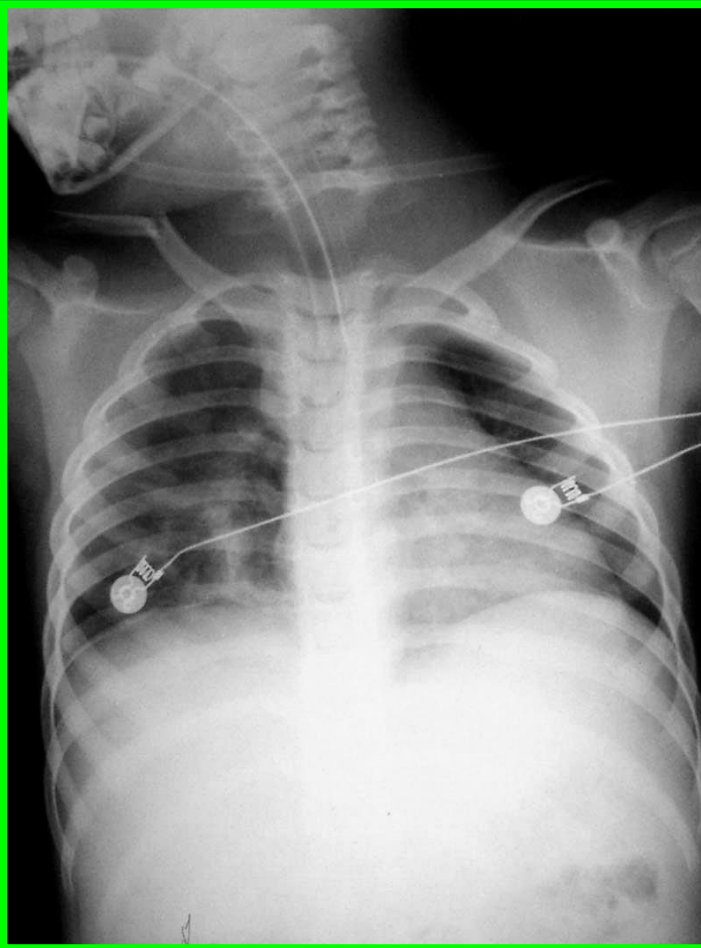
Anatomic Considerations?



Abdomen

- Softer, thinner wall
- Lower-riding liver, spleen

Anatomic Considerations?



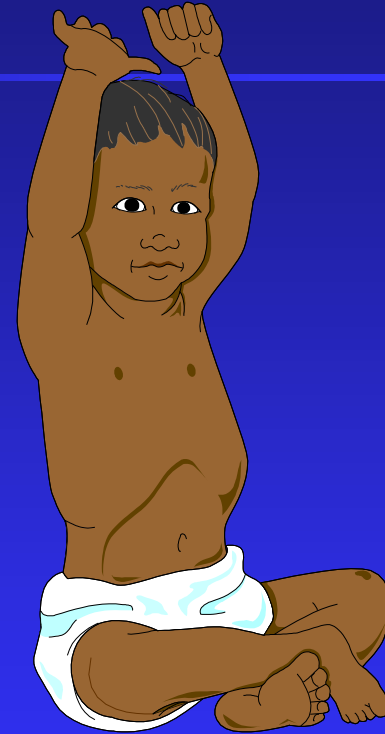
Spine

- ↑ Flexibility
- SCIWORA

Anatomic considerations?

Thermoregulation

- High ratio of BSA to body mass
- Thin skin
- Lack of subcutaneous tissue



**Prevent
hypothermia**



Impact of physiologic issues?

- **Vital signs**
- **Increased cardiovascular reserve**
- **Cerebral blood flow**



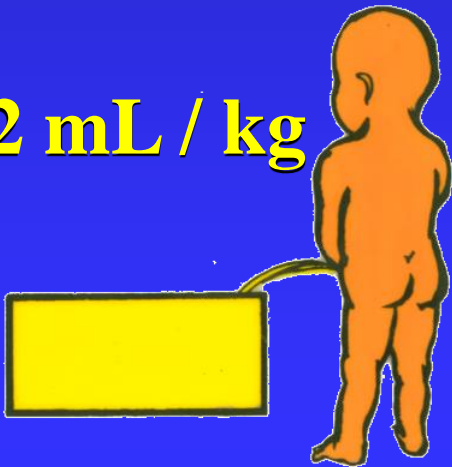
Management Issues: Vital Signs

Sign	0-3 years	3–5 years	6–12 years
HR	< 150 - 160	< 140	< 100 - 120
BP	> 60 - 70	> 75	> 80 - 90
RR	< 40 - 60	< 35	< 30

Management Issues: Output

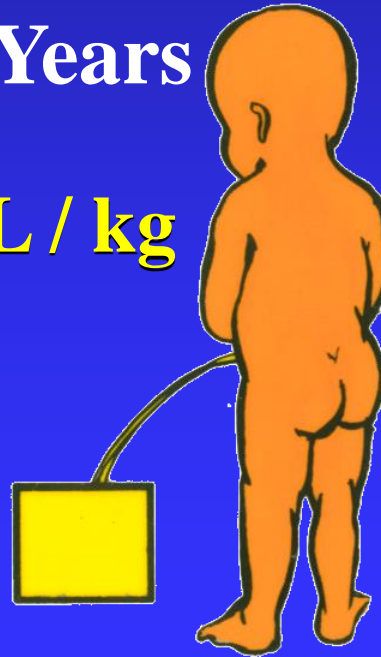
0 - 3 Years

2 mL / kg



3 - 5 Years

1 mL / kg

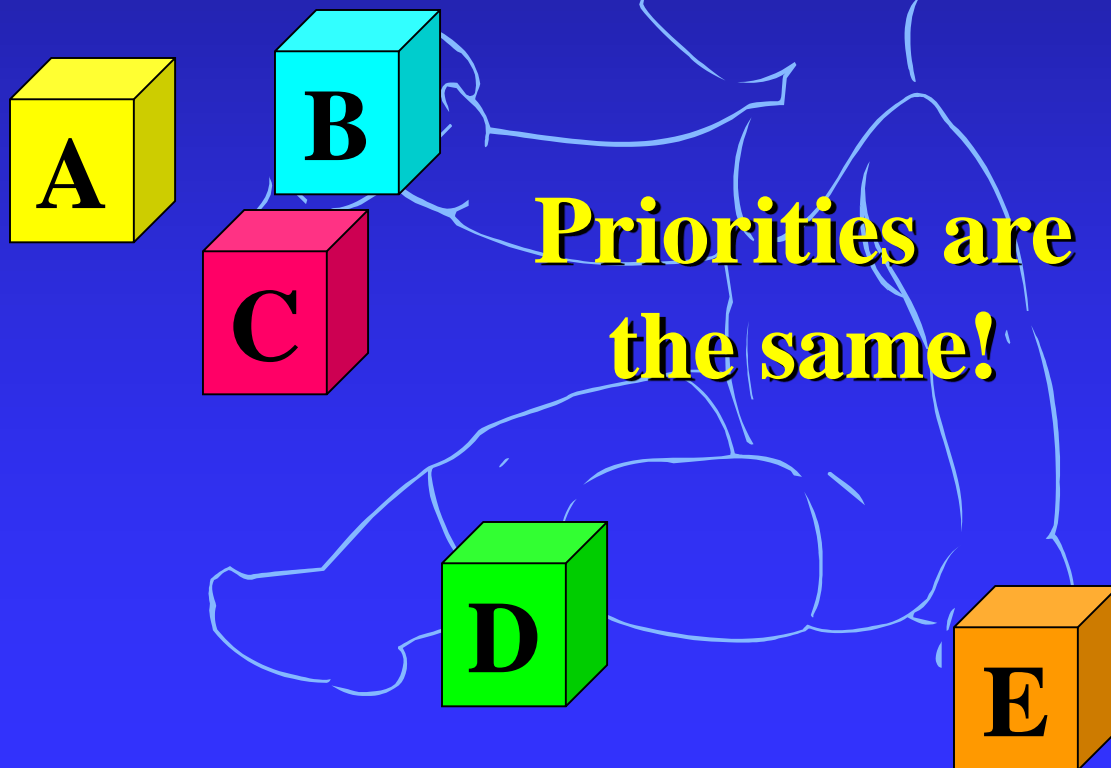


6 - 12 Years

0.5 - 1
mL / kg



Management Issues: ABCDEs





Management Issues: ABCDEs

A

Size of uncuffed ET tube

B

Compliant ribs, chest tube size

C

Fluid challenge, use of blood

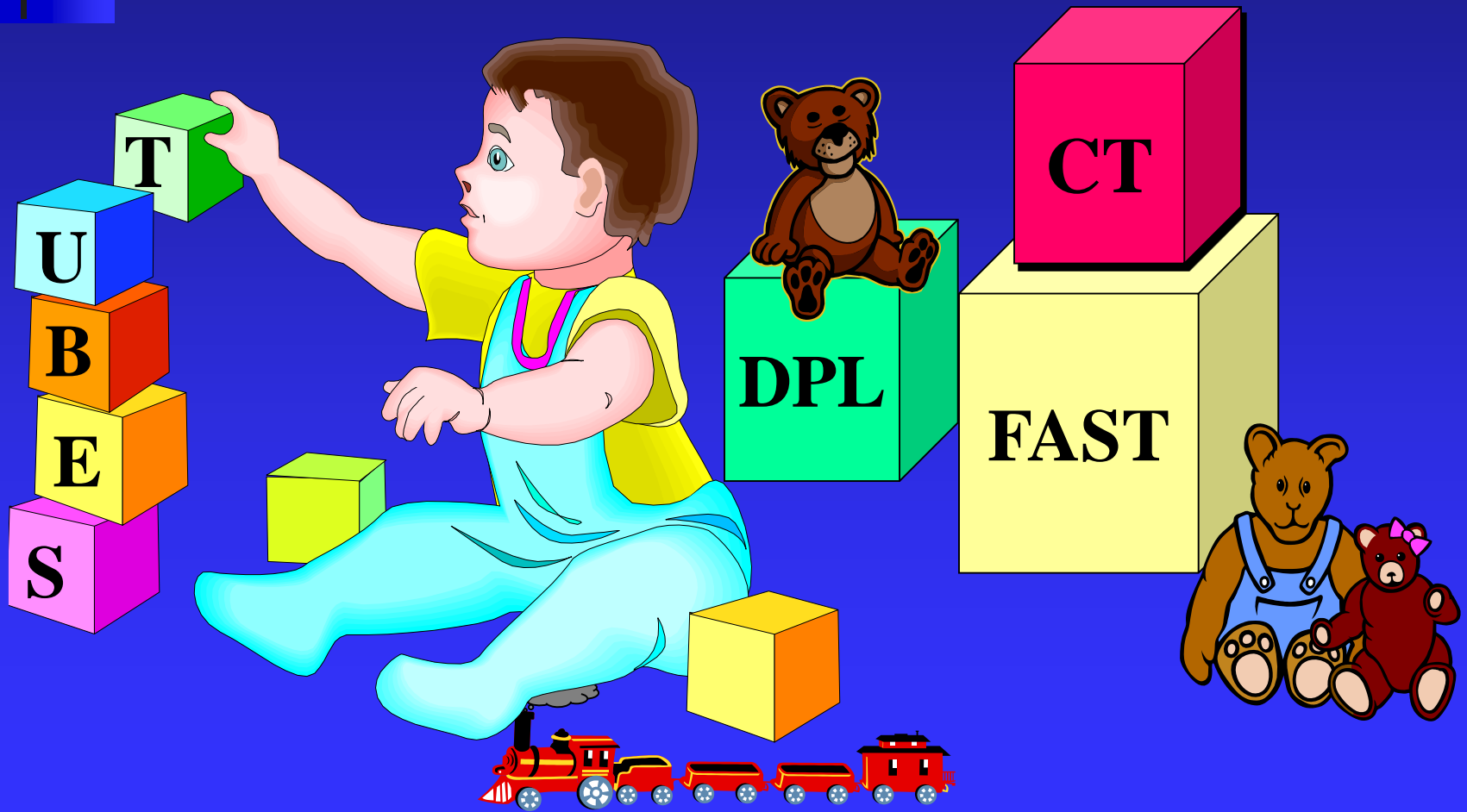
D

GCS Score, pediatric verbal score

E

Prevent heat loss

Management: Adjuncts





Recognize abuse injuries?

History

- Discrepancies
- Delay in care
- Repetitive injuries
- Inappropriate responses
- Medical neglect

Physical

- Multicolored bruises
- Retinal hemorrhages
- Bilateral subdurals
- Femur fracture(s)
- Unusual scald / contact burns



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Summary

- **Management principles are the same.**
- **Unique anatomic and physiologic differences modify the application of ATLS principles**
- **High index of suspicion for child abuse**
- **Involve the surgeon early!**