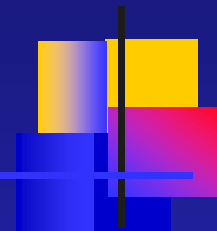


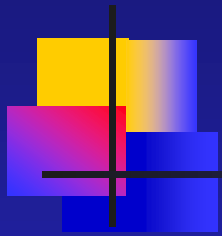


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# Pediatric Trauma

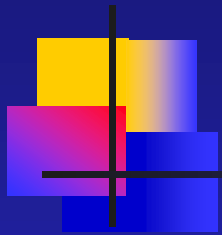
**Professor Dr. Samad Shams Vahdati**  
**Emergency medicine specialist**  
**&**  
**Neurovascular emergency fellowship**



# Objectives

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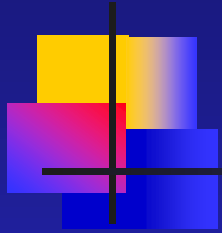
- **Identify unique characteristics of the pediatric trauma patient**
- **Identify injury patterns in children**
- **Discuss application of ATLS management principles to the injured child**



# Key Questions

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- 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?



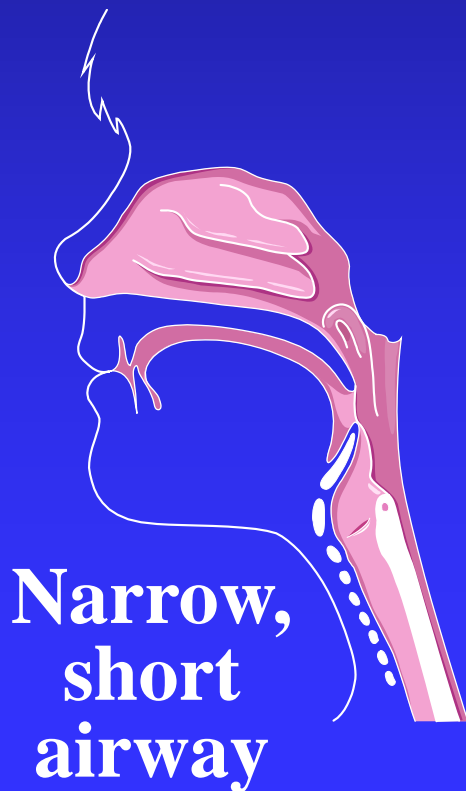
# Type of injuries sustained?

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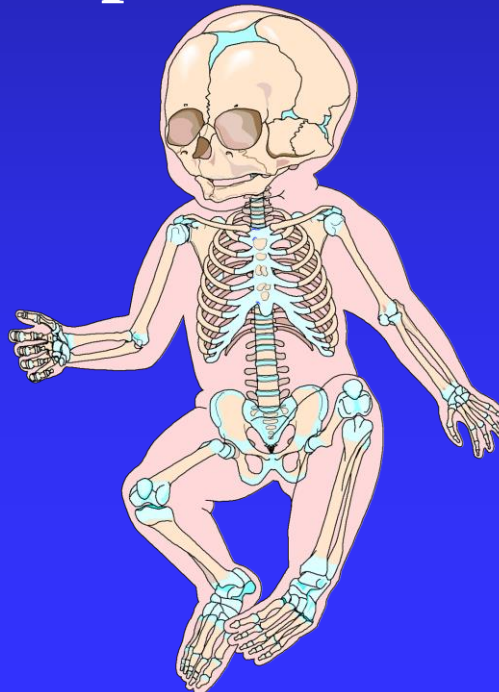
- **Age-related mechanism of injury**
- **Injury mortality surpasses all other diseases**
- **Mechanisms and patterns of injury**

# Anatomic considerations?

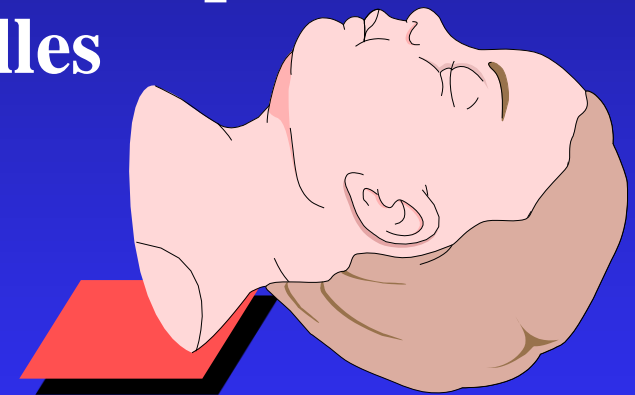
## Airway, Head, and Neck



## Open fontanelles

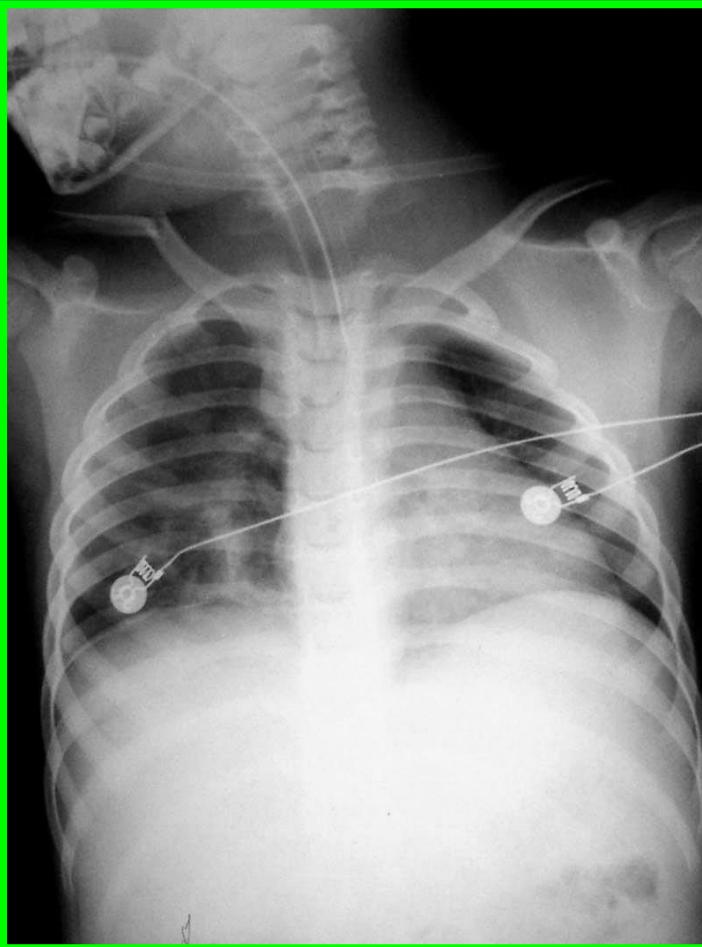


## Neutral position



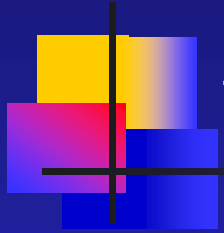
## Pad under torso

# Anatomic Considerations?



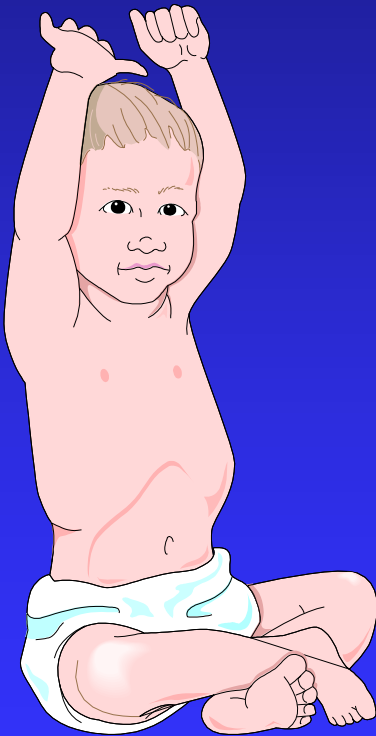
## Chest

- Pliable, soft wall
- Chest injuries poorly tolerated



# Anatomic Considerations?

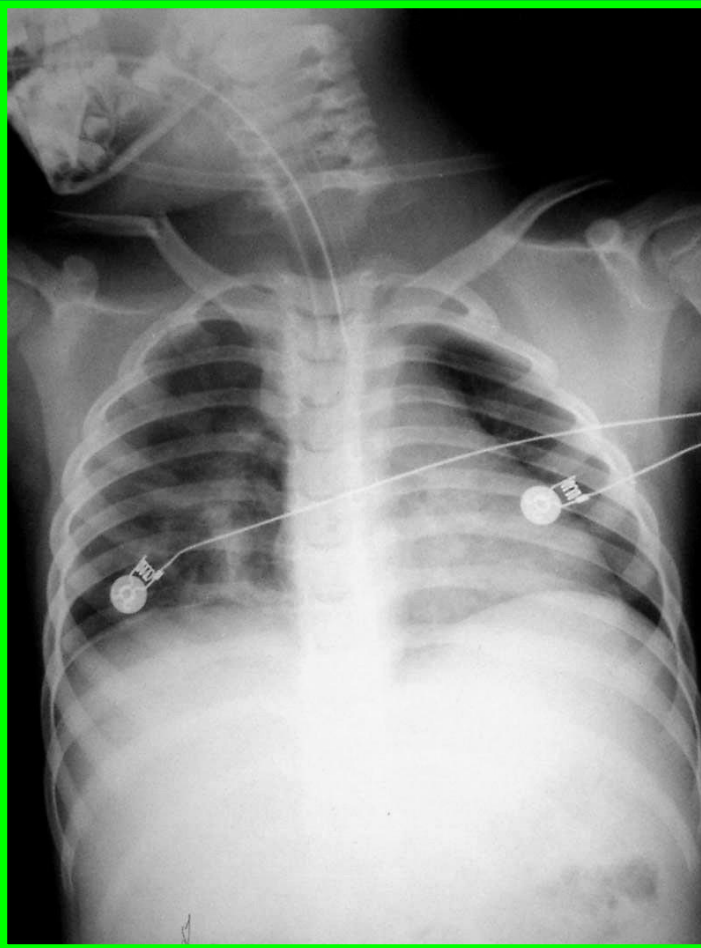
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## Abdomen

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

# Anatomic Considerations?



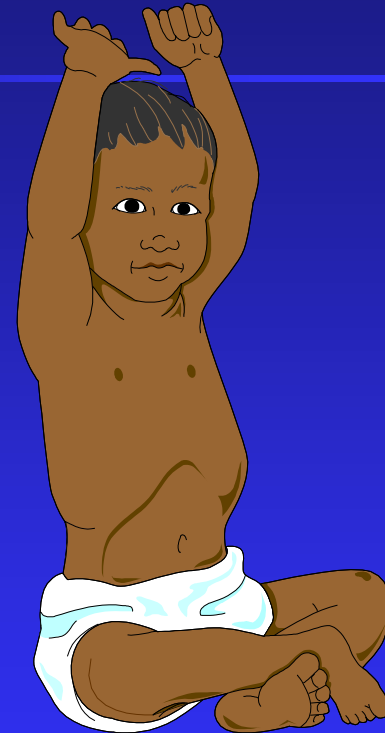
## Spine

- ↑ Flexibility
- SCIWORA

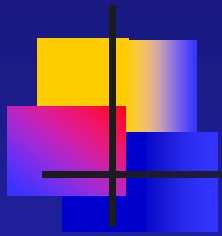
# Anatomic considerations?

## Thermoregulation

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



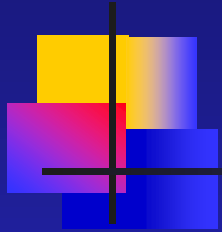
**Prevent  
hypothermia**



# Impact of physiologic issues?

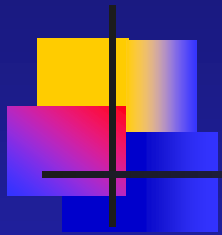
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- Vital signs
- Increased cardiovascular reserve
- Cerebral blood flow



# Management Issues: Vital Signs

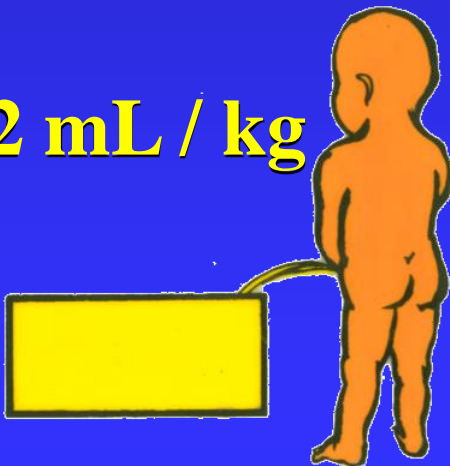
Sign	0-3 years	3–5 years	6–12 years
HR	< 150 - 160	< 140	< 100 - 120
BP	> 60 - 70	> 75	> 80 - 90
RR	< 40 - 60	< 35	< 30



# Management Issues: Output

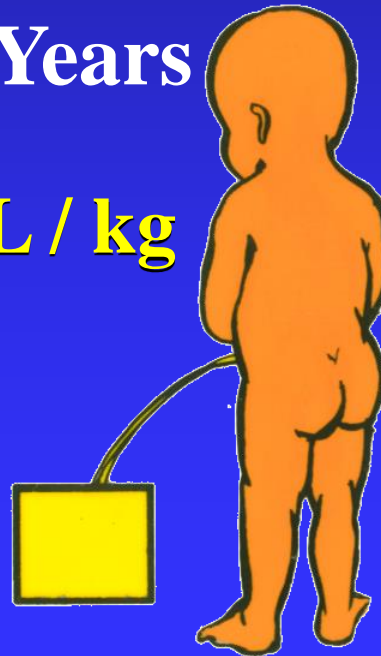
**0 - 3 Years**

**2 mL / kg**



**3 - 5 Years**

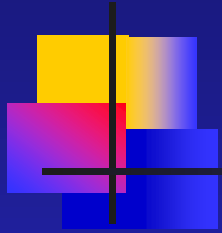
**1 mL / kg**



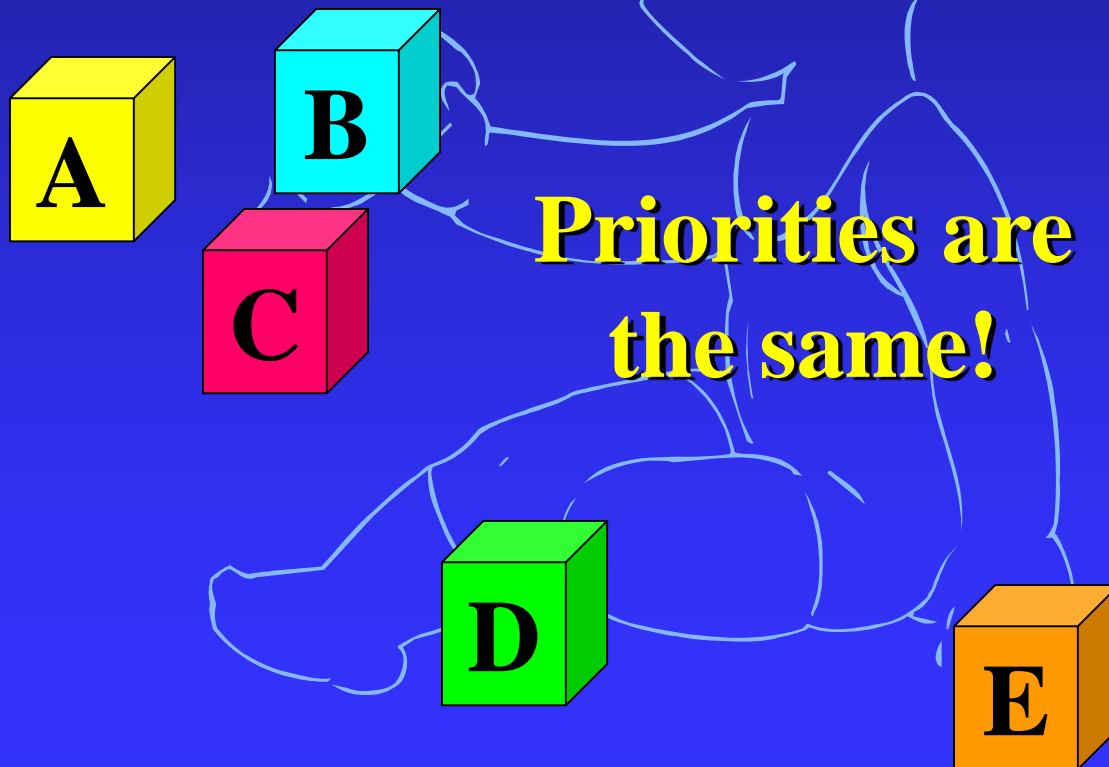
**6 - 12 Years**

**0.5 - 1  
mL / kg**





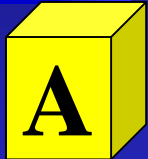
# Management Issues: ABCDEs





# Management Issues: ABCDEs

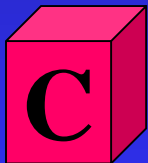
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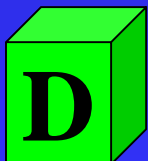
Size of uncuffed ET tube



Compliant ribs, chest tube size



Fluid challenge, use of blood

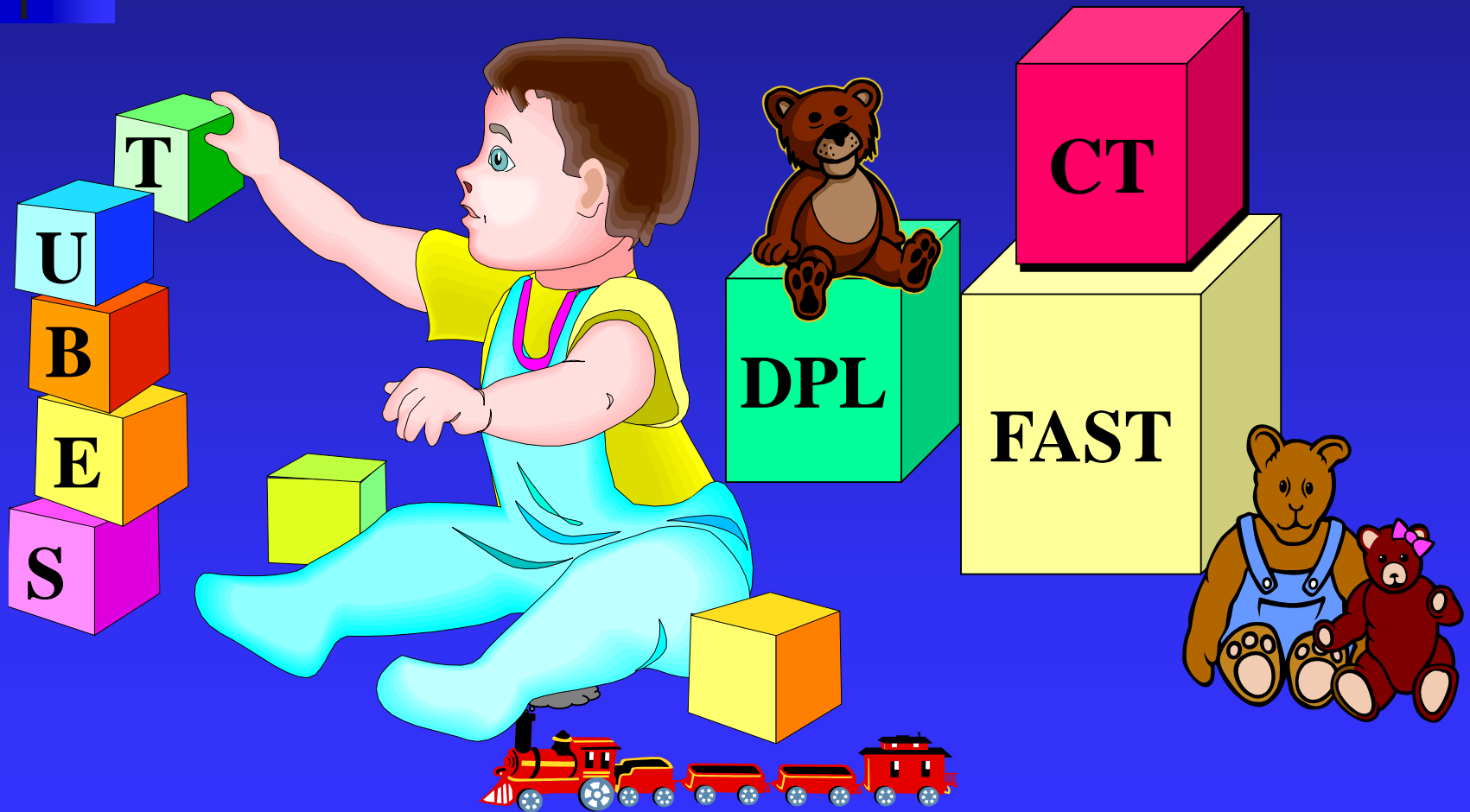


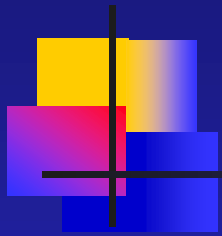
GCS Score, pediatric verbal score



Prevent heat loss

# Management: Adjuncts





# Recognize abuse injuries?

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## History

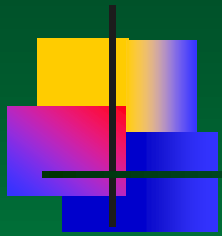
- Discrepancies
- Delay in care
- Repetitive injuries
- Inappropriate responses
- Medical neglect

## Physical

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



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# Summary

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- 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!**