Pediatric Emergency and Critical Care Lit

UPDATE

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Pediatric Advanced Life Support 2015

International Liaison Committee on Resuscitation (ILCOR)

- American Heart Association
- Heart & Stroke Foundation
- InterAmerican Heart Foundation
- European Resuscitation Council
- Resuscitation Council of Asia
- Australian Resuscitation Council
- Resuscitation Council of Southern Africa
- New Zealand Resuscitation Council
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<tr>
<td>Chest compression depth 1/3 of chest, up to 4 cm infants, 5 cm most children</td>
<td>Same except no more than 6 cm in adolescents (evidence of harm)</td>
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<tr>
<td>“Push Fast”, rate of at least 100/min</td>
<td>Use recommended adult compression rate of 100-120/min</td>
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<tr>
<td>Minimum atropine dose 0.1 mg due to paradoxical bradycardia</td>
<td>No minimum dose No routine in ETI Consider if bradycardia</td>
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<tr>
<td>Amiodarone recommended; Lidocaine 2nd line</td>
<td>Amiodarone or Lidocaine equally acceptable</td>
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<tr>
<td>Epinephrine <em>should</em> be given in cardiac arrest</td>
<td>Reasonable to give epinephrine</td>
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| Therapeutic hypothermia (32° to 34°F) may be considered | **OHCA**: normothermia or brief hypothermia  
**IHCA**: no data |
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<td>Benefit to delay cord clamping for 1 min</td>
<td>Delay cord clamp 30 sec if not requiring resuscitation</td>
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| Non-vigorous, meconium staining = endotracheal suctioning                | No routine suctioning  
Treat under warmer  
PPV for apnea, HR<100                                                   |
| Auscultate precordial pulse  
Palpate umbilical pulse                                                         | Add 3-lead ECG                                                           |
Cohen et al.

The non-diagnostic ultrasound in appendicitis: is a non-visualized appendix the same as a negative study?

Journal of Pediatric Surgery. 2015
What This Study Adds

Retrospective, 1,383 pts, 0-18 y

Majority (63.4%) non-diagnostic/non-visualized

NPV 84.7-86.36%

**IF** WBC <7.5x10^9/L **AND** non-diagnostic:

NPV 97.1-98.7%
Clinical Practice

**Not** basis for **rule-out**

May inform your **post-test probability**

More **options** for re-examination
Clinical features for diagnosis of pneumonia in children younger than 5 years: a systematic review and meta-analysis.

*Rambaud-Althaus C et al.*

*Lancet Infectious Disease.* 2015.
What This Study Adds

Fast breathing: Sens 62% Spec 59%
Lower chest wall indrawing: Sens 48% Spec 72%

RR > 50: LR+ 1.9 [1.45 – 2.48]
Nasal flaring: LR+ 1.75 [1.2 – 2.56]
Cough: LR- 0.3 [0.09 – 0.96]
Fever: LR- 0.53 [0.41 – 0.69]
Clinical Practice

No one clinical feature was sufficient to diagnose pneumonia.

Be aware of poor performance of predictors.

Use your best judgement and be the good doctor you are.
Bedside tests to predict laryngoscopic difficulty in pediatric patients.

*Inter J Pediatr Otorhinolaryngol.* 2016; 83:63-68.
What This Study Adds

Frontal Plane to Chin Distance (FPCD)
Height
Neck Circumference
Mallampati Index
BMI
Weight
Sternomental Distance
Thyromental Distance
Inter-incisor Distance
What This Study Adds

**Frontal Plane to Chin Distance (FPCD)**

- **Height**
- **Neck Circumference**
- **Mallampati Index**
- **BMI**
- **Weight**
- **Sternomental Distance**
- **Thyromental Distance**
- **Inter-incisor Distance**
FPCD (cm) to weight (kg) ratio > 0.2:

- Sensitivity 88.89%
- Specificity 73.68%
Clinical Practice

Retrognathism = Difficult Airway

“Kiss your airway goodbye…”
Andersen et al.

Time to Epinephrine and Survival After Pediatric In-Hospital Cardiac Arrest.

JAMA. 2015; 314(8):802-810.
What This Study Adds

Retrospective analysis, 1558 U.S. children < 18 yo

487 (31.3%) Survived to Discharge

Time-to-Epi: 1 min (IQR 0-4)

RR per minute delay: 0.95 [95% CI, 0.91 to 0.99]
Clinical Practice

Proxy for preparedness?

Primary Respiratory or Cardiac?

Interventions are time-sensitive
Hoffman et al.

Comparison of the **AVPU Scale** and the **Pediatric GCS** in Prehospital Setting.

*Prehosp Emerg Care*. 2016; Early Online 1-5.
What This Study Adds

Prospective cohort, 302 children < 10 yo
Median age 2.3

Alert (73.5%)
Verbal (13.9%)
Painful (9.4%)
Unresponsive (3.1%)

Verbal Stimuli:
100% PPV
pGCS ≥ 8
Clinical Practice

V = 8 = Great
Responds to Voice,
at least pGCS of 8

Only Pain? Only Gain…an ETT
Benefits of Strict Rest After Acute Concussion: A Randomized Trial.

Pediatrics. 2015
What This Study Adds

88 subjects, 11 to 22 years; w/n 24 h of concussion

RCT: 5 days rest versus usual 1-2 days rest

No clinically significant difference outcomes

Intervention group more symptoms
Clinical Practice

Brain rest may not be helpful

May prompt more symptoms (Hawthorne effect)

Editorial: Children often self-regulate activity

Usual care: 1-2 days rest
Moler et al.

Therapeutic Hypothermia after Out-of-Hospital Cardiac Arrest in Children.

What This Study Adds

295 Out-of-Hospital Cardiac Arrests; 2d – 18 y

RCT: 33° C versus 36.8° C

No significant difference in survival at 1 y

Similar infection rates, 28-day mortality
Clinical Practice

Comatose children who survive OHCA: no significant survival benefit for therapeutic hypothermia

Bottom Line: Just keep them afebrile and normothermic
Turner et al.

A Review of Pediatric Critical Care in Resource-Limited Settings.

What This Study Adds

Majority of childhood deaths preventable

Lower respiratory tract disease
Malaria
Diarrhea
Meningitis
Nutritional Deficiencies
Clinical Practice

Country-specific goals

Basics save lives

Research agenda set
Syncope in the Pediatric Emergency Department – Can We Predict Cardiac Disease Based on History Alone?

What This Study Adds

Cross-sectional, 3,445 subjects over 4 y
68 w/ previous dx, 3 new dx: 2 SVT, 1 myocarditis

If at least two features, 100% sens/spec:

• Syncope during exertion
• Exertion and chest pain
• Palpitations
• No prodrome
Clinical Practice

Low prevalence in this study

Populations differ

Use these as red flags in addition to your typical approach
Oxygen Saturation Targets in Infants with Bronchiolitis (BIDS): a Double-Blind, Randomized, Equivalence Trial

What This Study Adds

615 infants, 1:1 allocation standard/mod

Standard SpO₂: if <94%, then treat

Modified SpO₂: set monitor to display 90% as 94%

No difference in adverse events

2 death occurred in standard group
Clinical Practice

Careful with interpretation

Multiple factors to consider in bronchiolitis

Don’t let this be used against you!

Use it to substantiate your decision to discharge
Airway management complications in children with difficult tracheal intubation: a prospective cohort analysis.

What This Study Adds

Prospective, 1018 difficult pediatric intubations, 13 children’s hospitals

1st-pass success

Direct Laryngoscopy 3%
Fiber-optic 54%
Indirect Laryngoscopy 55%
Clinical Practice

Associated with complications

> 2 attempts

Weight < 10 kg

Thyromental distance

3 direct laryngoscopies before indirect

Go to video early!
Rankin et al.

Intravenous Fluid Bolus Prior to Neonatal and Infant Lumbar Puncture.

What This Study Adds
Prospective, convenience; 3 years, 40 pts
0 to 3 months, ddx pyloric stenosis

Difference in subarachnoid space $\text{mm}^2$

*Before* IV bolus: $37.8 \text{ mm}^2$
*After* IV bolus: $36.9 \text{ mm}^2$

$P = 0.42$
Clinical Practice

IV bolus probably doesn’t help.
Winter et al.

Risk Factors Associated with Infant Deaths from Pertussis: a Case-Control Study

CID. 2015; 61
What This Study Adds

Retrospective, fatal pertussis, <120 days; 1998-2014
53 fatalities v. 183 nonfatal hospitalized infants

- Significantly low birth weight
- Younger gestational age
- Younger age at onset
- Higher WBC; higher lymphocyte
- Multivariable: WBC, birth weight, ETI, NO
Clinical Practice

Recognize and treat early

Age, weight, WBC are red flags

Take \textless 3-month-old \textit{infant} with possible pertussis seriously
Double-Blind Prospective Randomized Controlled Trial of Dopamine versus Epinephrine as First-Line Vasoactive Drugs in Pediatric Septic Shock.

What This Study Adds

Dopamine 5-10 mcg/kg/min versus epinephrine 0.1-0. mcg/kg/min

Dopamine associated with death
OR 6.5 [1.1 to 37.8]

Dopamine associated with infection
OR 67.7 [5-910.8]

Epinephrine associated with survival
OR 6.49
Clinical Practice

Dopamine was never a good drug

We have **better vasopressors**

No problem using peripheral lines initially
Predictors of Emergency Department Utilization Among Children in Vulnerable Families.

What This Study Adds

Fragile Families and Child Wellbeing Study
5000 vulnerable children, 9-year follow-up

Hospitalization in last year  15.97 [6.64 to 38.4]
History of asthma  2.53 [1.17 to 5.44]
Clinic visit in last year  1.22 [1.12 to 1.33]
Caregiver ED visits  1.15 [1.03 to 1.28]
Clinical Practice

Over-utilization is a problem

Insurance status not predictive of ED utilization

Care coordination, education

Editorial: vulnerable child syndrome
Quick Links

1. 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care


