



## Welcome to PALS with Medical Education Angels!

For your greatest success, please be aware that the AHA assumes those taking PALS can interpret and determine appropriate treatments for a variety of patient conditions, such as respiratory distress and failure, shock and rhythm disturbances. If this is your first time, consider auditing a class for free to determine if you are ready and what you need to study.

- € **The test is now open book!** This means you can use your 2015 PALS Provider Manual or the ECC handbook. To download either of these to a kindle, e-reader or tablet use <https://ebooks.heart.org>.

You can also buy, borrow, rent, check out from the library, check out from your hospital library, etc.

- € The AHA has said that the pre-test should be completed with a grade of >70% in each of the areas. We ask full providers to bring their pre-test, but do not collect them from those recertifying. The link for the pre-test can be found on the page ii of the book. [www.heart.org/eccstudent](http://www.heart.org/eccstudent) and there's usually a code like pals15. There's FANTASTIC supplemental learning and practice videos and information on this site; it's definitely worth checking out.

- € If you need to review rhythms, we like [www.skillstat.com](http://www.skillstat.com) EKG simulator. Pay careful attention to those heart blocks and life threatening rhythms! There's also a brief review on page 311 in the PALS Provider book.

Try not to be too nervous! We remember how scared we were the first time we took PALS (extra scared thinking about kids!). We will do our best to empower you and practice with you until you feel strong and confident in your abilities. If you put in the initiative and study, we are sure to be successful.

The remainder of this welcome packet includes the agenda for your course, a reminder of the H's and T's, and a copy of the most current PALS algorithms.

Don't worry, you'll be great!

Sincerely,

Kristen & Vilate

## MEA PALS Recertification Course Agenda

- Life is Why
  - Science of Resuscitation Video
  - Basic Life Support Video
  - Systematic Approach Video
  - Team Dynamics Video
  - Post-Cardiac Arrest Care
  - Coping with Death
  - Skills Stations: OPA/NPA/ Respiratory Arrest
  - Skills Stations: CPR and use of the AED
  - Skills Stations: Electrical Station\*
  - Skills Stations: IO Access\*
  - Cardiac Rhythm Review/Skills Stations
  - Mega-Code Skills Testing
  - Written Exam- 84% or greater required to pass, allowed 1 hour to complete
- \*These can be omitted with recertification courses

## MEA PALS Full Provider Course Agenda

- Life is Why and Course Introduction
- Science of Resuscitation Video
- Basic Life Support
- Systematic Approach Video
- Team Dynamics Video
- Management of Respiratory Emergencies
- Management of Shock Emergencies
- Management of Arrhythmia Emergencies
- Post Cardiac Arrest
- Coping with Death
- IO Access Video and Skills Stations
- Cardiac Rhythm Review/Skills Stations
- Skills Stations: OPA/NPA/ Respiratory Arrest
- Skills Stations: CPR and use of the AED
- Skills Stations: Electrical Station
- Mega-Code Skills Testing
- Written Exam- 84% or greater required to pass, allowed 1 hour to complete

*Breaks are always taken as needed!*

*Do not hesitate to ask questions or for clarification.*

*We encourage you to bring a drink or snack! No one tests well when they're hungry. ☺*

*Please text or call us if you have additional questions:*

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**PALS Helpful Hints:** Don't panic! The test is now open book, but it is timed. Look these up, study and mark the pages in case you need to reference it.

PALS is divided up into 3 sections: respiratory, shock, and dysrhythmias. If you can look for ways to compare and contrast them, that might help you. We will review all of core cases in class as well.

The 4 respiratory cases are: Upper and Lower Airway, Disordered Control of Breathing, and Lung Tissue Disease.

The 4 shock cases are: Hypovolemic, Distributive/Septic, Obstructive, and Cardiogenic.

The cardiac algorithms are: Tachycardia, Bradycardia, PEA/Asystole, Pulseless VT/VF. There are also algorithms for post arrest and sepsis.

### **Know your drugs!**

- what they do, how they change your heart rate, and what condition they are used to treat.

Epinephrine  
Adenosine  
Amiodarone  
Lidocaine  
Atropine  
Magnesium  
Procainamide

### **Know your rhythms, especially the life-threatening ones!**

#### **Know your algorithms!**

Bradycardia  
Tachycardia  
PEA/Asystole  
Pulseless Vtach/Vfib  
Post Arrest

# H's and T's

The potentially reversible causes of cardiac arrest and near cardiac arrest.

<p>Hypovolemia Hypoxia Hydrogen ion loss – acidosis Hyperkalemia/Hypokalemia Hypothermia Hypoglycemia &amp; other metabolic disorders (no longer on most lists)</p>	<p>Tablets (drug overdose, accidents) Tampnade Tension Pneumothorax Thrombosis – coronary or pulmonary Trauma (no longer on most lists, usually considered under hypovolemia)</p>
<p><b>HYPVOLEMIA</b> 1. look for obvious signs of fluid/blood loss 2. secure IV/IO access 3. give fluid bolus and reassess</p>	<p><b>TABLETS</b> (drug OD, accidents) 1. support circulation while you find and administer reversal agent. Narcan reverses opiates/narcotics. Romazicon reverses benzodiazepines.</p>
<p><b>HYPPOXIA</b> 1. confirm chest rise bilaterally and lung sounds 2. check O2 source 3. spO2, ABG's, suction</p>	<p><b>TAMPONADE</b> (causes: chest trauma, CABG, etc.) 1. Look for: JVD, narrow pulse pressure 2. Pericardial centesis, return to OR</p>
<p><b>HYDROGEN ION LOSS</b> 1. respiratory – ensure adequate ventilation 2. metabolic – give NaHCO3 (sodium bicarbonate) 3. draw/evaluate CO2 in serum or pH on ABG</p>	<p><b>TENSION PNEUMOTHORAX</b> (s/s: chest asymmetry, hyper-resonance, decreased BS, high peak pressures, JVD, tracheal deviation, severe respiratory distress) 1. vent tension in chest with angio at 2ICS below clavical 2. CXR 3. support ventilation and oxygenation with BVM, intubate if necessary</p>
<p><b>HYPOTHERMIA</b> 1. consider warm NS infusion 2. warming measures</p>	<p><b>THROMBOSIS</b> (coronary or pulmonary) 1. consider fibrinolysis</p>
<p><b>HYPOLYCEMIA</b> 1. accu-check and administer reg insulin PRN</p>	<p><b>TRAUMA</b> 1. inspect body completely; remove clothing 2. secure airway 3. control external bleeding by applying pressure while concurrently giving crystalloids and blood products 4. look for s/s of internal bleeding; send lab work, do diagnostic tests as long as patient stable enough for exam, tap belly if suspicious for internal bleeding, call OR to be on call</p>
<p><b>HYPOKALEMIA</b> 1. look for flat T waves and U waves 2. administer potassium and consider checking and infusing Magnesium</p> <p><b>HYPERKALEMIS</b> 1. look for peaked T waves, tall ST or widening QRS 2. To move K intracellular:</p> <ul style="list-style-type: none"> <li>• CaCl 10%, 5-10ml/onset 1-3 min</li> <li>• Sod. Bicarb give 1 amp up to 1mEq/kg can repeat in 15 min./onset 5-10 min</li> <li>• Insulin &amp; Dextrose: 10u regular insulin/1 amp D50 (25gms) /onset 30 min</li> <li>• Nebulized Albuterol 10-20mg/15 minutes, may repeat / onset 15 min</li> <li>• Lasix 40-80mg IV / onset with diuresis</li> <li>• Kayexalate 15-50gm PO or rectal /onset 1-2 hours Pg 64, 65 ECC 2005, 2015 handbook</li> </ul>	



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# PALS

## Vital Signs in Children

### Normal Heart Rates\* (beats/min)

Age	Awake Rate	Sleeping Rate
Neonate	100-205	90-160
Infant	100-180	90-160
Toddler	98-140	80-120
Preschooler	80-120	65-100
School-aged child	75-118	58-90
Adolescent	60-100	50-90

### Normal Respiratory Rates (breaths/min)

Age	Rate
Infant	30-53
Toddler	22-37
Preschooler	20-28
School-aged child	18-25
Adolescent	12-20

### Normal Blood Pressures

Age	Systolic Pressure (mm Hg) <sup>†</sup>	Diastolic Pressure (mm Hg) <sup>†</sup>	Mean Arterial Pressure (mm Hg) <sup>‡</sup>
Birth (12 h, <1000 g)	39-59	16-36	28-42 <sup>‡</sup>
Birth (12 h, 3 kg)	60-76	31-45	48-57
Neonate (96 h)	67-84	35-53	45-60
Infant (1-12 mo)	72-104	37-56	50-62
Toddler (1-2 y)	86-106	42-63	49-62
Preschooler (3-5 y)	89-112	46-72	58-69
School-aged child (6-7 y)	97-115	57-76	66-72
Preadolescent (10-12 y)	102-120	61-80	71-79
Adolescent (12-15 y)	110-131	64-83	73-84

\*Always consider the patient's normal range and clinical condition. Heart rate will normally increase with fever or stress.

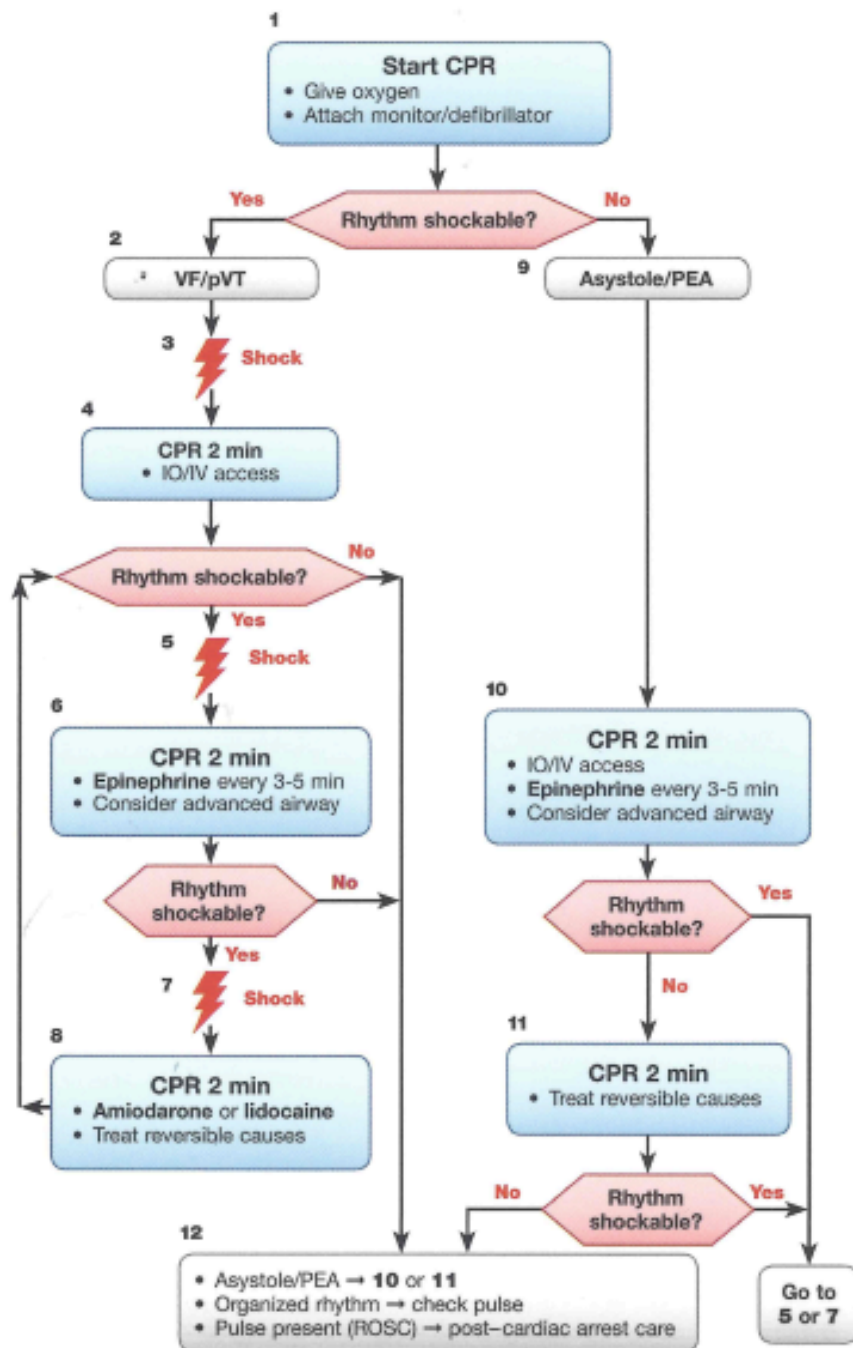
<sup>†</sup>Systolic and diastolic blood pressure ranges assume 50th percentile for height for children 1 year and older.

<sup>‡</sup>Mean arterial pressures (diastolic pressure + [difference between systolic and diastolic pressure/3]) for 1 year and older, assuming 50th percentile for height.

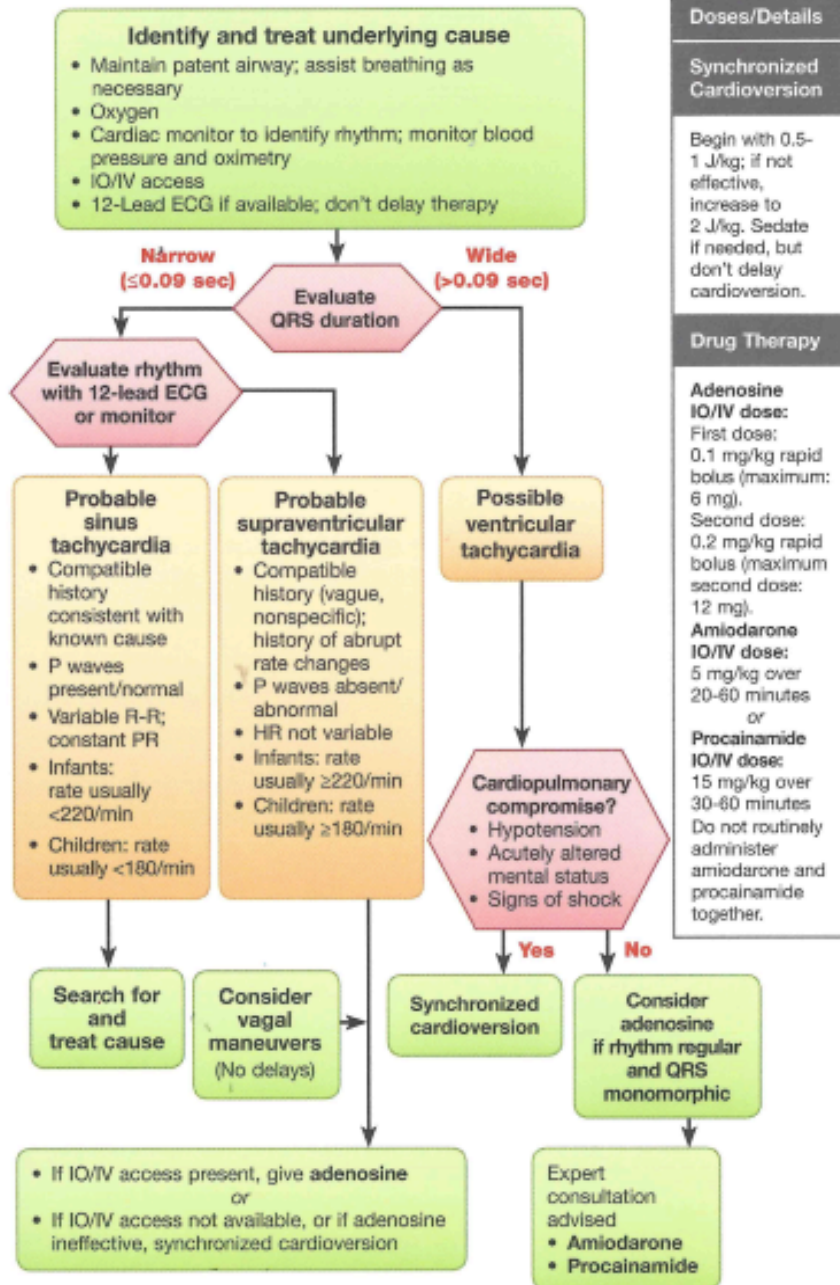
<sup>§</sup>Approximately equal to postconception age in weeks (may add 5 mm Hg).

Reproduced from Hazinski MF. Children are different. In: Hazinski MF, ed. *Nursing Care of the Critically Ill Child*. 3rd ed. St Louis, MO: Mosby; 2013:1-18, copyright Elsevier. Data from Gemelli M, Manganaro R, Mami C, De Luca F. Longitudinal study of blood pressure during the 1st year of life. *Eur J Pediatr*. 1990;149(5):318-320; Veremold HT, Kitterman JA, Phibbs RH, Gregory GA, Tooley WH. Aortic blood pressure during the first 12 hours of life in infants with birth weight 610 to 4,220 grams. *Pediatrics*. 1981;67(5):607-613; Haque IU, Zartsky AL. Analysis of the evidence for the lower limit of systolic and mean arterial pressure in children. *Pediatr Crit Care Med*. 2007;8(2):138-144; and National High Blood Pressure Education Program Working Group on High Blood Pressure in Children and Adolescents. *The Fourth Report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents*. Bethesda, MD: National Heart, Lung, and Blood Institute; 2005. NIH publication 05-5267.

## Pediatric Cardiac Arrest Algorithm—2015 Update



## Pediatric Tachycardia With a Pulse and Poor Perfusion Algorithm



## Pediatric Bradycardia With a Pulse and Poor Perfusion Algorithm

