

IU Health PALS Study Guide

Preparing for your upcoming PALS Class

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AS OF APRIL 1, 2011—WE ARE TEACHING THE 2010 AHA GUIDELINES. WE RECOMMEND REVIEWING THE NEW PALS ALGORYHMS PROVIDED FROM THE AHA WEB SITE.

Children are often unable to describe how they feel physically. Young children may be very ill or near death when their young heart is beating too fast or too slow. A child who is suffering from sepsis, croup of lung tissue disease from aspiration can't tell you what is going on. All they can tell you if they can speak at all is that they don't feel well. PALS shows us in a well thought out organized system how to carefully complete step-by-step assessment of the child. PALS also teaches us to recognize and act quickly as soon as a life threatening sign and/or symptom is discovered.

To complete the PALS course, you'll be required to complete two mega-codes. The first mega-code will come from the summation of the respiratory and shock instruction. After the video driven lecture and practice sessions, you'll be required to identify the patients primary cause for his/her illness and treat it accordingly. There are four respiratory categories and four shock categories. You'll learn to use the systematic approach of assessment including the general appearance; primary assessment and the secondary assessment along with any tertiary assessment.

You need to be prepared to recognize and correctly identify 7 rhythms listed below and treat them appropriately according to *American Heart Association* alagorithms and 2010 recommendations. Your treatments and actions are to be considered the most current and appropriate for research and evidence based practice at I.U. Health and by the AHA. You will have to perform roles that may be outside your standard scope of practice especially during the Megacode practice and testing portion of the PALS class. Use this as opportunity to familiarize yourself with all the activities going on around you during a code. As you are more aware of the bigger picture, you will better understand your own role within the code team at the bedside.

<u>BLS CPR</u>

BLS CPR has changed in 2010. The primary change is from the "ABC" to "CAB." After establishing unresponsiveness and calling for a code, check for a pulse in 5 to 10 seconds then begin compressions immediately. Compressions should begin within 10 seconds of your first patient contact. After thirty compressions, give your first two breaths. The 30:2 ratio then will continue for one rescuer CPR. We'll change to 15:2 when two people are performing CPR on



children and infants. "Look, listen and feel" for breathing has been removed from the new guidelines.

The use of an AED is now indicated for infants. This is also new for 2010.



- Is your patient stable or unstable?
- Stable- monitor closely
- Unstable/ Symptomatic this patient is showing signs of poor perfusion (their heart rate is not fast enough to deliver an adequate volume of blood to the body and requires treatment/ intervention) for example: low B/P, feels faint, decreased or altered mental status, cool or clammy/diaphoretic
 - ♥ CPR is indicated
 - Administer .01 mg/kg of Epinephrine 1:10,000 and repeat every 3-5 minutes if needed
 - ♥ If increase vagal tone or primary AV block, give Atropine .02 mg/kg
 - ♥ If Epinephrine is ineffective be prepared for transcutaneous pacing

Supraventricular Tachycardia-SVT (SUSTAINED rapid narrow complex tachycardía with a rate greater than 180 in children and 220 in íntants)



- Is your patient stable or unstable?
- Stable- Attempt vagal maneuvers like ice placed on the forehead with small children. Try asking older children to bear down or try a good hard cough. If this does not get them out of the SVT you want to consider Adenosine .1 mg/kg to a 6mg maximum dose. This is a drug that can be given 3 times and doubling the first dose for the administration of the second and third. It is only given with a physician order and a physician at the bedside per I.U. Health policy. Patient must be monitored as well.
- Unstable/ Symptomatic this patient is showing signs of poor perfusion (their heart rate too fast to deliver an adequate volume of blood to the body and requires rapid treatment/ intervention) for example: hypotensive, feels faint, decreased or altered mental status, cool or clammy/diaphoretic then consider synchronized cardioversion of .5 to 1 j/kg.



- Does your patient have a pulse with this rhythm? If not—follow the V-fib / pulseless VT algorhythm.
- With a PULSE and QRS > .09 sec we're going to synchronize cardiovert the rhythm at .5 1 j/kg just like SVT.
- You can attempt adenosine if it doesn't delay cardioversion
- Consider sedation if you have time (don't delay cardioversion) and patient somewhat alert.
- If the first attempt at synchronized cardio version didn't work-double energy level for the second attempt.





- VFib is a chaotic and disorganized rhythm that <u>generates absolutely no</u> <u>perfusion</u>! The heart is quivering at best and requires IMMEDIATE Electrical Intervention...do not delay
- The gold standard for I.U. Health is to defibrillate VF or (pulseless VT) within 2 minutes.
 - Rapidly assemble your team
 - Begin chest compressions
 - Apply defibrillator (hands-free) pads to patient and deliver 2j/kg for the first attempt.
 - Immediately resume compressions and bag mask ventilations at a rate of 15:2 (two rescuers)
 - You will continue CPR for 2 minutes (make sure your timer/recorder is tracking this for you) and prepare your first drug – your first medication will be Epinephrine .01mg/kg , but do not administer it yet ⁽ⁱ⁾
 - At 2 minutes clear to reevaluate your rhythm- if VF persists charge and defibrillate a second time at 4 j/kg, again resume compressions (make sure to rotate compressor and person bagging every 2 minutes for optimal compressions- you will get tired quickly)
 - During this 2 minute cycle administer the Epinephrine and prepare the second medication- 5 mg/kg (max of 300mg which is the adult dose)
 - Again at the 2 minute mark clear to reevaluate your rhythm- if VF persists charge and defibrillate at least 4 j/kg, again resume compressions (new in 2010: defibrillation of up to 10 j/kg is indicated but not to exceed adult limits).

- During this 2 minute cycle administer the Amiodarone 5 mg/kg. and prepare your next dose of Epinephrine which will be the same amount as the first.
- ♥ These 2 minute cycles of *rhythm check- shock if indicated- CPR-administer med* will continue as long as VF or pulseless VT persists or until the code is called by the physician.

Asystole-Ventrícular Standstíll - Absolutely no electrícal or



- Asystole requires immediate intervention
 - Begin compressions and airway management. REMEMBER CAB!
 30:2 for 1 person CPR and 15:2 for 2 person CPR.
 - Administer appropriate medication
 - ♥ Epinephrine .01mg/kg IVP
 - What is the last medication you administered? Epinephrine is the preferred medication, but you must determine if it is due! We give Epi every 3-5 minutes or every other 2 minute cycle after the rhythm check when compressions resume.
 - A critical step to restoring a perfusing rhythm is to quickly identify one of the underlying/reversible causes that most frequently lead to asystole. The most common are known as the H's & T's! As a team leader you should run through the list for consideration.
 - H's & T's are as follows: Hypoxia, Hypothermia, Hypo/Hyperkalemia, Hydrogen Ion (acidosis), Hypovolemia, Toxins, Tension Pneumothorax, Tamponade, Thrombus (coronary or pulmonary)



<u>Pulseless Electrical Activity (PEA)</u> - Electrical Activity without mechanical contractility, you have an organized rhythm, but the heart isn't





- What do you do if you are in a code and you find an organized rhythm on the monitor?
 - CHECK FOR A PULSE! If you have one congratulations! If you have a rhythm and no pulse you are in PEA
 - ♥ Begin compressions and airway management
 - ♥ Administer appropriate medication
 - ♥ Epinephrine .01mg/kg IVP
 - What is the last medication you administered? Epinephrine is the preferred medication, but you must determine if it is due! We give Epi every 3-5 minutes or every other 2 minute cycle during a rhythm check.
 - A critical step to restoring a perfusing rhythm is to quickly identify one of the underlying/reversible causes that most frequently lead to PEA. The most common are known as the H's & T's! As a team leader you should run through the list for consideration.
 - H's & T's are as follows: Hypoxia, Hypothermia, Hypo/Hyperkalemia, Hydrogen Ion (acidosis), Hypovolemia, Toxins, Tension Pneumothorax, Tamponade, Thrombus (coronary or pulmonary)
 - Remember- PEA is not always a Sinus Rhythm and it is not always a slow PEA. PEA can present as any rhythm "electrically", it is the

absence of a pulse that determines the presence of PEA. The most critical step will be quickly identifying a reversible cause along with high quality CPR!

During class you will have opportunity to get hands-on practice with each of these rhythms and their appropriate algorithms. If you study the content the application in the simulation labs will pull it all together for you and your instructor will help tie it all together and answer any additional questions you may have. <u>This content</u> is not intended to replace your ACLS provider manual- you are still required to have the manual or borrow one provided by your department in preparation for and while attending class.

Don't forget your PALS pre-course assessment!



How to Calculate the EKG • Rate

In preparation for your ACLS it is not only important for you to be able to identify the rhythms but determine the rate as well. Here is the nitty gritty to help you accomplish this task.

<u>EKG paper</u> is comprised of many boxes: each of the following can be used in different methods to calculate a strips correct rate.

- ♥ 1 tiny box=0.04 second
- ♥ 1 large box=(5 tiny boxes)0.20 second
- ♥ 6 second strip=30 large boxes
- ♥ 1 minute strip=300 large boxes
- ♥ 1 minute strip=1500 tiny boxes





<u>The Countdown Method</u>: This does not require a 3-second or 6-second strip and can be used easily at the bedside. It is accomplished by memorizing this sequence: 300, 150, 100, 75, 60, 50, 40, and 30. You find a QRS complex that falls close to a heavy line and count large boxes between the QRS complexes using these numbers. See example below. This method only works for regular rhythms.



<u>The 1500 Method</u>: Count the tiny squares between identical points on 2 consecutive QRS complexes. Then divide 1500 by the number of tiny boxes to obtain the heart rate.

<u>The 300 Method</u>: Count the number of large squares between 2 consecutive QRS complexes...then divide 300 by the number of large boxes to obtain the heart rate.



<u>The 3 Second Strip Method</u>: Using a 3 second strip (15 large squares=3 seconds), count the number of QRS complexes and multiply by 20 to obtain the heart rate.



<u>The 6 Second Strip Method</u>: Using a 6 second strip (30 large squares=6 seconds), count the number of QRS complexes and multiply by 10 to obtain the heart rate.



References

- Ralston, M., Hazinski, M, F., Zaritsky, A, L., & Schexnayder, S, M. (Eds.). (2006). *Pediatric* advanced life support course guide. Dallas, Texas: American Heart Association.
- Ralston, M., Hazinski, M, F., Zaritsky, A, L., & Schexnayder, S, M. (Eds.). (2010). Pediatric

advanced life support provider manual. Dallas, Texas: American Heart Association.