PRO-CPR

2015 Guidelines:
PALS Algorithm Overview

(Non-AHA supplementary precourse material)

Please reference “Circulation” (from our website), the ECC Handbook, or the 2015 ACLS Course Manual for correct drug dosages.
**Pulseless Rhythms**  
(No Perfusion Despite Visible Cardiac Rhythm)

**Obtain:** O2, IV, Monitor/Defibrillator/Emergency Cart

Search for & treat underlying cause: “PATCH up the patient!”
- Pulmonary embolism
- Acute MI
- Acidosis
- Tension Pneumothorax
- Tablets/Toxins
- Cardiac Tamponade
- **Hypo:** volemia, oxia, glycemia, thermia, magnesemia
- **Hyper & Hypo:** kalemia

Shockable Pulseless Rhythms: Think “PATCH”
Ventricular Fibrillation, Ventricular Tachycardia, Torsades de Pointes.

First… Restore effective oxygenation, ventilation & circulation

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Begin high quality CPR asap: Compressions, Airway, Breathing

Defibrillate asap!

Resume CPR quickly after each shock, & give appropriate drug as soon as IV/IO in place.

Continue….

CPR x 2 min. for the following 2 rescuer scenario:
Child & Infant = 10 cycles of 15:2, > Drug > Shock.

Rotate compressors every 2 min. Keep rhythm checks to 10 secs or less.

<table>
<thead>
<tr>
<th>V. Fib., V.Tach</th>
<th>Torsades de Pointes with Long QT Interval</th>
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<tbody>
<tr>
<td>Epinephrine</td>
<td>Epinephrine</td>
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<tr>
<td>Amiodarone or Lidocaine</td>
<td>Magnesium sulfate</td>
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**Remember:**
* Max out one antiarrythmic before considering another.
* Begin maintenance infusion of whichever antiarrythmic resulted in conversion to perfusing rhythm.
* High quality CPR & early defibrillation with epinephrine (within 30-45 sec.) is of primary importance! Clinical interventions should not significantly delay/interrupt defibrillation or CPR!

Non-shockable Pulseless Rhythms:
PEA (Pulseless Electrical Activity) & Asystole

Find and treat an immediately correctable cause. Think “PATCH!”

Begin high quality CPR asap! 5 cycles, of 15:2, or if intubated, deliver 20 ventilations per minute with uninterrupted chest compressions. This means ventilate over 1 second, every 3 sec. For PEA remember to "Push Epi Always."
**Bradycardia**  
*(Ventricular Rate <60/min.)*

**Obtain:** O2, IV, Monitor, 12 Lead EKG, Emergency Cart

Search for & treat underlying cause: “PATCH”

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**Stable: Adequate Pulse, Perfusion, & Respirations**  
Observe: EKG, vital signs, O2 as necessary, report any change in status.

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**Unstable: Poor Perfusion, predicted B/P = 70 + 2x (age) true hypotension**  
Will be associated with symptoms such as: Shortness of breath, dyspnea, cyanosis, decreased level of consciousness, hypotension, & shock.

Regardless of pacemaker site (wide or narrow QRS complex, or regular / irregular rhythms), rate enhancement with improved perfusion is key!

We must: Provide 100% O2, assist ventilation as necessary.  
- Decrease vagal stimulus (use Atropine with caution)  
- Increase conduction through the AV Node.  
- Provide regular & effective electrical stimulus to the Ventricles.

**Drug / Intervention:**  
Begin CPR if heart rate <60/min., & showing no response to oxygenation & ventilation.  
**Epinephrine** IV/IO is our drug of choice to increase vasoconstriction, heart rate & B/P.  
**Atropine** will be effective on Bradycardias secondary to increased vagal tone or 1st & 2nd Degree AV Blocks. It will have little or no effect on Complete AV Block, Idioventricular rhythms, or on denervated (transplanted) hearts. In these cases, anticipate & prepare for **Trancutaneous Pacing. Transvenous Pacing** may be the ultimate solution!

**Seek Expert Consultation!**
Tachycardia  
(Ventricular Rate > 100 min.)

Obtain: O2, IV, Monitor, 12 Lead EKG, Emergency Cart

Seek expert consultation!

Note: Most rate related symptoms are uncommon if heart rate is < 180 for children, or 220/min. for infants. Seek expert consultation for any tachycardia in the presence of poor perfusion.

Rule out Sinus Tachycardia! Is it a body problem: febrile, hypovolemic, dehydration? Is it a cardiac problem: Supraventricular Tachycardia or Ventricular Tachycardia?

Search for & treat underlying cause: “PATCH.”

Unstable Tachycardia: Inadequate Perfusion With Pulse.

Ventricular Rate > 180/ min. for children, > 220 / min. for infants.

May be associated with symptoms such as: Shortness of breath, dyspnea, cyanosis, delayed capillary refill, decrease level of consciousness, hyptotension, & shock.

*Support patent airway & breathing.

*If Adenosine delivery is delayed or unsuccessful, prepare for Synchronized Cardioversion. Sedate conscious patient; do not delay cardioversion.

Stable Tachycardia: Adequate Perfusion With Pulse.

Ventricular Rate = 140-180 /min. for children or 180 - 220/ min. for infants.

Obtain: O2, IV, Monitor, 12 Lead EKG

*N*Support patent airway & breathing.

*Observe: EKG, vital signs, report any changes.

*R*ule out Sinus Tachycardia! Use heart rate & presenting signs & symptoms to differentiate between SVT & Sinus Tachycardia. Remember, Sinus Tachycardia is a “body” problem, while SVT is clearly a “cardiac” problem.

Narrow QRS (0.09 or <): Regular

Wide QRS (0.09 or >): Regular & Monomorphic

Supraventricular Tachycardia

Vagal Maneuvers

Adenosine

Possible Ventricular Tachycardia

Adenosine, then:

Amiodarone or Lidocaine

Again, seek expert consultation
Tachycardia

Additional thoughts…….

When is doubt, always seek expert consultation!

Use heart rate, presence of “P” waves, and presenting signs & symptoms to differentiate between PSVT, SVT and Sinus Tachycardia. Remember, Sinus Tachycardia is a compensatory result of a “body” problem that can be easily treated by identifying the underlying cause (i.e. fever, dehydration, anemia), while PSVT & SVT is clearly a “cardiac” problem.

Identify between Supraventricular (narrow QRS) & Ventricular Tachycardias (wide ORS). Supraventricular Tachycardia with Bundle Branch Block can appear as a Ventricular rhythm. For the stable patient, try vagal maneuvers &/or 12 Lead EKG to help differentiate between Ventricular & Supraventricular rhythms. Vagal maneuvers generally slow Supraventricular, but not Ventricular rhythms. Adenosine is recommended for both instances however, the rhythm MUST be monomorphic.

With the exception of Adenosine, if the patient remains tachycardic after the next rate control drug is maxed out, do not give additional drugs. Compounding drugs may have a pro-arrhythmic effect on the heart. Let cardioversion be your “2nd drug.”

Tachycardias caused by unstable “re-entry” (premature beat lands on preceding “T” wave) such as SVT & VT, respond well to synchronized cardioversion. Unstable Atrial Fibrillation & unstable Atrial Flutter may also respond well to synchronized cardioversion.

Tachycardias caused by “automatic” pacemakers (pacemaker cells spontaneously depolarizing at a rapid rate ) such as Junctional Tachycardia, 2:1 Atrial Flutter, & Ectopic Atrial Tachycardia may respond better to drugs. Cardioversion is often ineffective & may actually increase the rate!

One more time…. When in doubt, always seek expert consultation!