



# Foundations Frameworks

## Approach to Cardiac Arrest

Author: *Quentin Reuter, MD*

Editors: *Patrick Lank, MD; Kristen Grabow Moore, MD, MEd*

- The First Four Actions
  - The first four actions are the initial steps that must be taken in every cardiac arrest. If you walk in the room, and the patient has just lost a pulse, these are the first things you must initiate:
    - Begin chest compressions
    - Get pads on the patient, charge the defibrillator
    - Start BVM to oxygenate/ventilate the patient
    - Give 1 mg of epinephrine (place IO if needed)
- Treatment During Arrest
  - The treatment algorithms can be complicated to remember and especially difficult to recall while leading the resuscitation of a cardiac arrest. A simplified treatment algorithm is as follows:
    - Everyone: Epinephrine 1 mg Q3-5 minutes. V Fib, unstable V Tach, PEA, and asystole all receive epinephrine. The hope is that epinephrine will help raise the blood pressure enough to perfuse the coronaries to increase the likelihood of successful electrical cardioversion
    - V Fib/V tach
      - Electrical defibrillation: 200 J Biphasic, 360 J monophasic
      - Amiodarone 300 mg IVPB followed by a 150 mg IVPB if conversion not achieved
      - Can also consider lidocaine (1.5 mg/kg or 100 mg) for VF/pulseless VTach
      - If VTach is suspected to be Torsades de pointes, give magnesium (2g in 10 mL D5W administered over 5 min)
      - Consider calcium chloride, dextrose, or sodium bicarbonate as indicated based on known medical history
    - PEA/Asystole:
      - Epi and compressions
      - Consider giving Ca/glucose/bicarb
    - Consider tPA for suspected pulmonary embolism (PE) or acute myocardial infarction (AMI)
      - PE: If a cardiac arrest patient has confirmed PE, major risk factors for PE, or bedside ultrasound findings concerning for PE (RV strain pattern), consider giving tPA
      - AMI: Obtain an EKG immediately following ROSC. If a STEMI is present, activate cath lab. If patient is too unstable for the cath lab or not at cath center, consider pushing tPA in consultation with a cardiologist
      - tPA dosing: 50-100 mg push, generally CPR should be continued for at least 15 minutes following administration of tPA
  - The most important factors in ACLS are good chest compressions and electrical cardioversion when indicated. Give everyone epi and start thinking through more advanced treatments tailored to the reversible causes
- Reversible Causes
  - Remembering the H's and T's is another tough challenge. Think through reversible causes like you think through every critically ill patient:
    - Airway/Breathing: hypoxia, tension pneumothorax

- BVM/intubate patient, listen for bilateral breath sounds (or use US) and needle decompress if tension pneumothorax present
  - Circulation: Hypovolemia, Myocardial Infarction, Tamponade, PE
    - Use cardiac US to diagnose tamponade, RV strain (could be PE or AMI)
    - Look for signs of wall motion abnormalities or “blown-out” poorly contracting LV concerning for AMI/LAD lesion
    - Give fluids. One of the most common causes of in hospital PEA is hypovolemia (also helpful in an RV infarct)
    - Consider tPA if suspicion for AMI/PE. Some data show large survival benefit with tPA in massive PE
    - Get an EKG if you get ROSC
  - Drugs/Metabolic: Hyperkalemia, Na channel blockers/BB/CCB, Acidosis, Hypoglycemia, Hypo/Hyperthermia
    - Obtain stat VBG
    - Calcium will help stabilize cardiac membrane in hyperkalemia
    - Sodium bicarb pushes will treat Na Channel Blockade (look for wide QRS). Bicarb drips are never effective for this indication
    - Glucose for hypoglycemia
    - Will likely see wide QRS on EKG with hyper K, Na blockers, acidosis
    - Look for sinus bradycardia and AV nodal blocks in BB/CCB overdose
- ROSC Management
  - Again, start over with your ABCs, as done with every critical patient
    - Airway/Breathing: intubate, avoid hypoxia, avoid hypercarbia
      - Low tidal volume ventilation (6-8 cc/kg)
      - Order post intubation sedation/analgesia
      - Check ABG
    - Circulation: fluids as needed, norepinephrine/vasopressors as needed
      - Post-ROSC patients develop distributive shock
      - Obtain adequate resuscitative lines (which can large bore peripheral lines)
      - Place central venous catheter and/or arterial line for additional access and monitoring as able.
    - Disability/Neuro: targeted normothermia or hypothermia per hospital guidelines
- EKG = Disposition
  - Cath Lab vs ICU
  - STEMI: get these patients to the cath lab
    - You can see ST elevation in post arrest patients simply due to compressions/epinephrine/shocks. Consider rechecking another EKG in 15 minutes
    - An initial rhythm of V fib is predictive for AMI
  - No STEMI: discuss the utility of cardiac catheterization with cardiology, 20-30% of these patients will still have a culprit lesion

#### References

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