



Ventricular Fibrillation Pulseless Ventricular Tachycardia



Cardiac Arrest
Protocol AC 3

AT ANY TIME

Return of
Spontaneous
Circulation



Go to
Post Resuscitation
Protocol AC 10

	<p>Begin Continuous CPR Compressions Push Hard (≥ 2 inches) Push Fast (100 - 120 / min) Change Compressors every 200 compressions (sooner if fatigued) (Limit compressor changes ≤ 5 seconds)</p> <ul style="list-style-type: none">Pulse checks ONLY when EtCO₂ not available or at end of cycle with spike in EtCO₂ readings <p>Ventilate 1 breath every 20th compression Monitor EtCO₂ when available</p>
	AED Procedure if available
P	Defibrillation Procedure
	IV or IO Access Protocol UP 6
A	<p>Epinephrine (1:10,000) 1 mg IV / IO At 5 minutes from initial Epinephrine Dose Second Dose is based on EtCO₂ level</p> <p>If EtCO₂ is < 30 mmHg Epinephrine (1:10,000) 1 mg IV / IO</p> <p>If EtCO₂ ≥ 30 Do not repeat Epinephrine Maximum 2 mg Total Dose If VF / VT refractory to defibrillation, delay Epinephrine administration until after 2d defibrillation</p>
	Search for Reversible Causes
	<p>If Rhythm Refractory</p> <ul style="list-style-type: none">Continue CPR and give Anti-arrhythmics and Epinephrine as indicatedContinue CPR up to point where you are ready to defibrillate with device charged. Repeat pattern during resuscitation.
P	<p>Lidocaine 1.0 mg/kg IV / IO May repeat 1.0 mg/kg IV / IO if refractory Maximum 3 mg/kg</p> <p>IF LIDOCAINE NOT AVAILABLE Amiodarone 300 mg IV / IO</p> <p>May repeat if refractory Amiodarone 150 mg IV / IO</p> <p>If refractory, Magnesium 2 gm IV / IO</p> <p>Administer medications in drug-shock-drug-shock pattern</p>
	Defibrillation Procedure If VF / VT refractory after 3 shocks consider changing vector of defibrillation pads
	Cardiac: Mechanical CPR – LUCAS Procedure CSP-8 if available

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)



Notify Destination or
Contact Medical Control





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PRIMARY FOCUS IS ON HIGH-QUALITY, CONTINUOUS, AND UNINTERRUPTED COMPRESSIONS:

Compressor Responsibilities:

- Compress at rate of 120/ minute
- Push ≥ 2 inches depth of compression
- Allow complete recoil of chest on upstroke
- Call out every 20th compression
- Next compressor moves into ready position at compression 180
- Do not interrupt compressions > 5 seconds

ALS Responsibility:

- Ensure adequate compressions and ventilations
- Establish IV or IO access and administer first epinephrine
- Charge defibrillator every sequence at the 180th compression

Ventilator Responsibilities:

- Ventilate ONLY at every 20th compressions
- Same rate with BVM, BIAD, or ETT
- May help compressor count
- DO NOT HYPERVENTILATE

LUCAS Mechanical CPR:

- Ventilate ONLY every 6 seconds (GREEN LIGHT FLASHES)
- Charge defibrillator at the 2-minute mark (3-BEEP)
- When fully charged, pause LUCAS for rhythm check

Airway takes precedence if cardiac event or a primary respiratory event, drug overdose, drowning, hanging, suffocation, or trauma.

Medication Dosing:

- If EtCO₂ falls below 30 mmHg during the first 30 minutes of the resuscitation give the additional 1 mg of Epinephrine.
- Atropine not likely beneficial and no longer indicated with PEA or Asystole (can give at discretion of team leader to max of 3 mg.)
- **Hyperkalemia: Unknown in field setting.** End stage renal dialysis patient is at risk and Sodium bicarbonate and Calcium chloride should be given. ECG findings may not reflect common teaching such as peaked T waves. PEA with a bizarre or widened complex may indeed be hyperkalemia.
- **Toxicology:** Consider Calcium Channel Blocker (CCB) and Beta Blocker (BB) overdose with PEA and asystole. If suspected BB overdose give Glucagon 2 mg IV. If you see ECG improvement you may repeat and then contact medical control. Large doses of Glucagon may be needed. Calcium Chloride (or Ca gluconate - preferred) may be beneficial in BB overdose. If suspected CCB overdose administer 1 amp of Calcium Chloride (or Ca gluconate-preferred) over 3 minutes. If you see ECG improvement you may repeat and then contact medical control.
- **Termination of Resuscitation:** Follow On Scene Resuscitation / Termination of Resuscitation On Scene Protocol AC 12.

Pearls

- **Team Focused Approach / Pit-Crew Approach recommended; assigning responders to predetermined tasks. Refer to optional Team Focused CPR Protocol AC 11 or development of local agency protocol.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE, ventilate ONLY at every 20th compression with BVM, BIAD, or ETT.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Reassess and document BIAD and / or endotracheal tube placement and EtCO₂ frequently, after every move, and at transfer of care.**
- **IV / IO access and drug delivery is secondary to high-quality chest compressions and early defibrillation.**
- **IV access is preferred route. Follow IV or IO Access Protocol UP 6.**
- **Defibrillation:**
 - Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
 - Charge defibrillator during chest compressions, near the end of 2-minute cycle, to decrease peri-shock pause.
 - Following defibrillation, provider should immediately restart chest compressions with no pulse check until end of next cycle.
- **End Tidal CO₂ (EtCO₂)**
 - If EtCO₂ is < 10 mmHg, improve chest compressions. Goal is ≥ 20 mmHg.
 - If EtCO₂ spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**
 - Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
 - Renal Dialysis / Renal Failure** - Refer to Dialysis / Renal Failure Protocol AM 3 caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
 - Opioid Overdose** - If suspected, administer Naloxone per Overdose / Toxic Ingestion Protocol TE 7 while ensuring airway, oxygenation, ventilations, and high-quality chest compressions.
 - Drowning / Suffocation / Asphyxiation / Hanging / Lightning Strike** – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Magnesium Sulfate is not routinely recommended during cardiac arrest, but may help with Torsades de points, prolonged QT, low Magnesium States (malnourished / alcoholic), and suspected digitalis toxicity**
- Return of spontaneous circulation: Heart rate should be > 60 when initiating anti-arrhythmic infusions.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.