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Adult Medical

General Approach to Cardiac Arrest

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(Stable) Wide Complex Tachycardia >150

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Treat wide complex tachycardia (QRS> 120 msec) as ventricular tachycardia

Full ALS Assessment and Treatment including 12 lead EKG

Stable: Normotensive, baseline mental status, no signs of shock

**Do not delay cardioversion to obtain an EKG or obtain vascular access in an unstable patient*

Cardiac Emergencies

Wide, ***Irregular*** rhythm (i.e Torsades)

2g IV/IO Magnesium Sulfate over 2 minutes

Administer **Lidocaine** 1mg/kg IV/IO

If persists, may repat at 0.5mg/kg IV/IO every 5-10 minutes with a maximum cumulative dose of 3 mg/kg

Follow with continuous infusion 1 to 4mg/minute

Wide, ***regular*** rhythm

Administer **Amiodarone** 150mg IV/IO over 10 minutes every 10 minutes as needed (450mg total)
OR
Administer **Lidocaine** 1mg/kg IV/IO

If persists, may repat at 0.5mg/kg IV/IO every 5-10 minutes with a maximum cumulative dose of 3 mg/kg

Follow with continuous infusion 1 to 4mg/minute

Transport to PCI Capable Hospital

PEARLS

- DDx: Arrhythmia, Dehydration, Sepsis, Fluid Overload, Pulmonary Embolism, Thyrotoxicosis, Toxin/Ingestion, Acute Coronary Syndrome, Electrolyte abnormality
- Diltiazem is contraindicated in patients with a wide complex rhythm or history of Wolf Parkinson White (WPW) Syndrome
- Polymorphic Ventricular Tachycardia when associated with prolonged QT may be Torsades de pointes. Magnesium Sulfate is indicated in these cases. If Polymorphic Ventricular Tachycardia is related to ischemia, Magnesium may not be helpful
- If suspicion for hyperkalemia (history of ESRD on dialysis, renal failure) administer:
  -Calcium Chloride 1g IV/IO
  -Sodium Bicarbonate 1 mEq/kg Iv/IO (max 50 mEq)
- Amiodarone and Magnesium can cause hypotension and prolong QT

(Unstable) Wide Complex Tachycardia >150

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Assume wide complex tachycardia (QRS> 120 msec) is ventricular tachycardia

Unstable: Systolic < 90mmHg, altered mental status, signs of shock, pulmonary edema, ischemic chest pain

Full ALS Assessment and Treatment including 12 lead EKG

**Do not delay cardioversion to obtain an EKG or obtain vascular access in an unstable patient*

Cardiac Emergencies

Wide, ***Regular*** rhythm

Synchronized Cardioversion: 100 J> 200 J> 300 J> 360 J

Sedation: Fentanyl 1mcg/kg IV/IO (max 100mcg) may be administered prior to cardioversion if access available if BP > 100 mm Hg

If re-occurs after shocks, administer **Amiodarone** 150mg IV/IO over 10 minutes every 10 minutes as needed (450mg total)
OR
Administer **Lidocaine** 1mg/kg IV/IO

If persists, may repat at 0.5mg/kg IV/IO every 5-10 minutes with a maximum cumulative dose of 3 mg/kg

Follow with continuous infusion 1 to 4mg/minute

Wide, ***Irregular*** rhythm (i.e Torsades)

UNsynchronized Cardioversion
(Defibrillation 360J)

If no improvement

2g IV/IO Magnesium Sulfate over 2 minutes

If no improvement

Administer **Lidocaine** 1mg/kg IV/IO

If persists, may repat at 0.5mg/kg IV/IO every 5-10 minutes with a maximum cumulative dose of 3 mg/kg

Follow with continuous infusion 1 to 4mg/minute

Transport to PCI Capable Hospital

PEARLS

- DDx: Arrhythmia, Dehydration, Sepsis, Fluid Overload, Pulmonary Embolism, Thyrotoxicosis, Toxin/Ingestion, Acute Coronary Syndrome, Electrolyte abnormality
- Diltiazem is contraindicated in patients with a wide complex rhythm or history of Wolf Parkinson White (WPW) Syndrome
- Polymorphic Ventricular Tachycardia when associated with prolonged QT may be Torsades de pointes. Magnesium Sulfate is indicated in these cases. If Polymorphic Ventricular Tachycardia is related to ischemia, Magnesium may not be helpful
- If suspicion for hyperkalemia (history of ESRD on dialysis, renal failure) administer:
  -Calcium Chloride 1g IV/IO
  -Sodium Bicarbonate 1 mEq/kg Iv/IO (max 50 mEq)
- Amiodarone and Magnesium can cause hypotension and prolong QT

(A-Fib) Irregular Narrow Complex Tachycardia >150

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This protocol is specific only to a **narrow** complex tachycardia with an irregular rhythm. Consult Wide Complex Protocol for irregular wide complex tachycardia.

Full ALS Assessment and Treatment including 12 lead EKG

Asymptomatic

Continuous cardiac monitoring

500ml NS Bolus
**reassess lung sounds*
Contraindicated in pulmonary edema

Symptomatic

Stable: Normotensive, baseline mental status, no signs of shock

Diltiazem 20mg IV over 2 minutes

1L NS Bolus
**reassess lung sounds*
**Contraindicated in pulmonary edema*
(may repeat if BP decreases below 90mmg Hg systolic)

Unstable: Systolic < 90mmHg, altered mental status, signs of shock

**Do not delay cardioversion to obtain an EKG or obtain vascular access in an unstable patient*

Synchronized Cardioversion: 200 J> 300 J> 360 J

Sedation: Fentanyl 1 mcg IV/IO (max 100mcg) may be administered prior to cardioversion if access available & bp> 100 mmHg

Cardiac Emergencies

PEARLS

- DDx: Arrhythmia, Dehydration, Sepsis, Fluid Overload, Pulmonary Embolism, Thyrotoxicosis, Toxin/Ingestion, Acute Coronary Syndrome, Electrolyte abnormality
- Atrial Fibrillation with Rapid Ventricular Rate can be a compensatory mechanism in a patient with a history of Atrial Fibrill ation and an acutely underlying illness. Removing this compensation by treating with medications or cardioversion may cause the patient to acutely decompensate. For this reason, it is important to analyze the rhythm carefully and consider alternative causes of tachycardia such as fever, sepsis, pain, dehydration, fluid overload, Pulmonary Embolism, etc.
- **Diltiazem is contraindicated in patients with a wide complex rhythm or history of Wolf Parkinson White (WPW) Syndrome**

Regular Narrow Complex Tachycardia >150

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Full ALS Assessment and Treatment including 12 lead EKG

Sinus Tachycardia: Regular rhythm **with** P waves

1L NS Bolus
**reassess lung sounds*
Contraindicated in pulmonary edema

SVT: Regular rhythm **without** P waves

Stable: Normotensive, baseline mental status, no signs of shock

Vagal Maneuvers
(valsalva with passive leg raise)

Adenosine 6mg **rapid** IV over 1-3 seconds (followed by rapid IV push of 10ml NS)

If no improvement

Adenosine 12mg **rapid** IV over 1-3 seconds (followed by rapid IV push of 10ml NS)

Unstable: Systolic < 90mmHg, altered mental status, signs of shock

If IV access, may trial Adenosine 6mg **rapid** IV over 1-3 seconds (followed by rapid IV push of 10ml NS)

Otherwise or if no improvement

Synchronized Cardioversion: 100 J> 200 J> 300 J> 360 J

Sedation: Fentanyl 1 mcg IV/IO (max 100mcg) may be administered prior to cardioversion if access available & bp> 100 mmHg

**Do not delay cardioversion to obtain an EKG or obtain vascular access in an unstable patient*

PEARLS

- DDx: Arrhythmia, Dehydration, Sepsis, Fluid Overload, Pulmonary Embolism, Thyrotoxicosis, Toxin/Ingestion, Acute Coronary Syndrome, Electrolyte abnormality
- Sinus tachycardia can be a compensatory mechanism for an underlying illness. Removing this compensation by treating with medications or cardioversion may cause the patient to acutely decompensate. For this reason, it is important to analyze the rhythm carefully. If the rhythm is regular and there are no P-waves, it is safe to treat as Supraventricular Tachycardia.

Bradycardia <50

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Full ALS Assessment and Treatment including 12 lead EKG

Stable: Normotensive, baseline mental status, no signs of shock

250 ml NS

Unstable: Systolic < 90mmHg, altered mental status, signs of shock

Do not delay pacing to obtain a 12 lead EKG or to obtain IV access if patient is unstable

250 ml NS
Repeat as needed, titrate to systolic >90 mmHg
Reassess lung sounds

1st or 2nd degree block: Atropine 1mg IV (if IV in place)
Repeat every 3 minutes as needed (max 3mg)

No improvement, delay in IV or 3rd Degree Block

Demand Mode Transcutaneous Pacing

Sedation: Fentanyl 1mcg/kg IV/IO (max 100mcg) or Ketamine 0.5mg/kg IV (50mg max) may be used as needed

No improvement

Push Dose Epinephrine 10mcg (1mL) q1-2 min. max 100mcg (10mL) to increase blood pressure to systolic 90 mmHg and HR>50. Consider initiating Epinephrine Drip as needed

Persistent Hypotension: Norepinephrine infusion at around 8-12 mcg/ minute (30-45 gtt/min), titrated to maintain SBP > 90 mm Hg

Cardiac Emergencies

Non-intrinsic cardiac causes:

- **Beta blocker or Calcium Channel blocker overdose:** 50 meq IV/IO Sodium Bicarbonate, Calcium Chloride 1g IV/IO, Glucagon 2mg IV/IO/IV
- **Opiate overdose:** 2mg IV/IO/IM/IN Narcan
- **TCA Antidepressant:** 50 meq IV/IO Sodium Bicarbonate
- **Hyperkalemia:** 50 meq IV/IO Sodium Bicarbonate, Calcium Chloride 1g IV/IO, Albuterol 2.5mg/3ml

Transport to PCI Capable Hospital

Do not disconnect monitor until the receiving staff is ready to resume pacing on their monitor

PEARLS

- Ddx: Acute Coronary Syndrome, Hyperkalemia, Renal Failure, Drug Overdose, Head Injury, Stroke, Pacemaker Failure
- Transcutaneous Pacing:
  - Start at the lowest milliamps; increase in 10 mA increments until electrical & mechanical capture achieved. Once achieved, increase by 5-10 mA
  - Start the rate at 70 and increase to achieve a systolic BP>90 mmHg (max 100 bpm)
- In the presence of a Second or Third Degree Block with hypotension, begin Transcutaneous Pacing. Do not wait for IV/IO access . TCP is favored over Atropine.
- Post Cardiac Arrest- It is preferred to start with Epinephrine over TCP as it may be difficult to recognize re-arrest w/ TCP which delays CPR initiation

Asystole/Pulseless Electrical Activity

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Follow General Approach to Cardiac Arrest Protocol (Including Epinephrine every 3- 5 minutes)

Asystole/PEA

Treat possible reversible causes early

Hypovolemia	NS Bolus 1L IV/IO (repeat as needed)
Hypoxia	Secure airway and ventilate
Hydrogen Ion (acidosis)	50 meq IV/IO Sodium Bicarbonate
Hypoglycemia	D10 IV/IO infusion
Hyperkalemia	50 meq IV/IO Sodium Bicarbonate Calcium Chloride 1g IV/IO
Tension Pneumothorax	Needle Decompression
Toxins	• Beta blocker or Calcium Channel blocker overdose: 50 meq IV/IO Sodium Bicarbonate, Calcium Chloride 1g IV/IO, Glucagon 2mg IV/IO/IV • Opiate overdose: 2mg IV/IO Narcan
Thrombosis	

Cardiac etiology suspected?

YES → Transport to PCI capable hospital

NO → Transport to closest appropriate ED (excludes freestandings)

PEARLS

- When asystole is seen on the cardiac monitor confirmation of the rhythm shall include a printed rhythm strip, as well as interpretation of the rhythm in more than one lead. Low amplitude V-Fib or PEA may be difficult to distinguish from asystole when using only the cardiac monitor display for interpretation.
- Reassess Supraglottic and Endotracheal tube placement via ETCO2 after every move, and at transfer of care.
- When available, US can assist in identifying some of the H·s and T·s (cardiac tamponade, pulmonary embolism, pneumothorax, hypovolemia)
- An example of ´Cardiac etiology suspectedµ is a witnessed arrest in a patient with an EKG concerning for a STEMI

Ventricular Fibrillation or Pulseless V-tach

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Follow General Approach to Cardiac Arrest Protocol (including Epinephrine every 3-5 minutes)

Ventricular Fibrillation or Pulseless Ventricular Tachycardica

1st Shock- 200 J	Amiodarone 300 mg IV/IO or Lidocaine 1mg/kg IV/IO
2nd Shock- 360 J	Amiodarone 150 mg IV/IO or Lidocaine 0.5mg/kg IV/IO
3rd Shock- 360 J	Place a 2nd set of pads Anterior & Posterior
4th Shock- 360 J	Switch to using the 2nd set of pads for the shock

Refractory V-Fib (4 continuous shocks without a conversion of the rhythm at any point)	2g Magnesium Sulfate IV/IO
	50 meq IV/IO Sodium Bicarbonate
	If persistent then Lidocaine IV/IO repeat dose: 0.5-0.75 mg/kg every 5 to 10-minutes, max cumulative dose of 3 mg/kg. Follow with continuous infusion of 1 to 4 mg/minute **after return of circulation**.

Perform Double Sequential Defibrillatoin

- Ensure 2nd set of pads are not overlapping. If touching or overlapping, do not attempt procecure. Verify that both monitors are attached and confirm Vfib/Vtach
- Charge both monitors to 360J and ensure all team members are clear of the patient
- Defibrillate by pressing both shock buttons, one after the other (less than 1-2 seconds a part)
- Follow defibrillation with immediate compressions

Transport Recurrent Vfib/Vtach and Refractory V-Fib/V-tach to PCI capable hospital

PEARLS

- Continue CPR while defibrillator is charging. Resume compressions immediately after each shock. Do not delay compressions t o reassess rhythm.
- Consider and treat reversible causes (H·s and T·s)
- If persistent VF/VT then Lidocaine IV/IO repeat dose 0.5 mg/kg every 5 to 10 minutes with maximum cumulative dose of 3 mg/kg. Follow with continuous infusion of 1 to 4 mg/minute **after return of circulation**.
- **Recurrent** Vfib/Vtach- has converted to another rhythm but subsequently returns to vfib/vtach.
- Refractory Vfib/Vtach- has not converted after 4 shocks in a row during a code and has not responded to antiarrhythmics.
- Reassess Supraglottic and Endotracheal tube placement via ETCO2 after every move, and at transfer of care.

No Resuscitation Attempt

If there is any question about the need for resuscitation, immediately begin resuscitation while contacting medical control.

Resuscitation is not indicated if the patient is unresponsive, pulseless, and apneic and meets the criteria below:

Obvious signs of death

- Decomposition
- Rigor mortis
- Dependent lividity
- Incineration
- Decapitation
- Hemicorporectomy

Valid DNR

- Must be on yellow paper
- Must be signed by patient and patient·s provider (physician, physician assistant, or advanced practice registered nurse)
- POLST forms are not valid in FL

Blunt or Penetrating Trauma

None of the below present:

- Spontaneous movement
- Pupillary reflexes
- Organized rhythm (narrow complex)
- *Cardiac activity on US (as available)

PEARLS

- A living will may specify the healthcare surrogate or power of attorney appointed to make healthcare decisions
- A Healthcare proxy is someone who becomes the decision maker when there is no Healthcare surrogate and the patient is incapacitated
- The Healthcare proxy order can be found in Fl Statute 765.401. Decision making is deferred first to the spouse, then the majo rity of the children, then the parents, then the majority of the siblings, then other relatives or friends.
- In Florida, a healthcare surrogate supersedes any Healthcare proxy.
- Death is final. When ethical situations arise, it is best to transport the patient to allow time to work through the ethics. For example, the hospital and the decision maker can complete a DNR form once the patient arrives, if appropriate.

Termination of Resuscitation

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Follow General Approach to Cardiac Arrest Protocol

20 min. on scene resuscitation

Assess for Termination of Resuscitation Criteria

Age > 18

Transport not initiated

Initial rhythm is asystole and remains asystole throughout, confirmed in two leads and on printed rhythm strip

Secure airway confirmed by digital capnography (ETT or SGA)

At least four doses of Epinephrine have been administered (given every 3-5 min)

Cardiac arrest refractory for at least 20 minutes of ACLS

Quantitative ETCO2 value is < 10 mmHg with effective CPR, after 20 minutes of ACLS

All above criteria met?

YES

Transport or Consult Medical Control

Terminate resuscitative efforts

Provide the following information:

- Initial rhythm and any rhythm changes
- Method of airway management and vascular access
- Medications given during the arrest
- ETCO2 value
- Total Downtime
- Total amount of time working the arrest
- Advanced Directives

** US interpretation as available (communicate if cardiac standstill)

PEARLS

- The paramedic has the discretion to continue resuscitation efforts in any case despite Termination of Resuscitation criteria being met if scene safety, location, patient·s age, time of arrest, or bystander input compels this decision.
- When asystole is seen on the cardiac monitor confirmation of the rhythm shall include a printed rhythm strip, as well as interpretation of the rhythm in more than one lead. Low amplitude V-Fib or PEA may be difficult to distinguish from asystole when using only the cardiac monitor display for interpretation.
- ETCO2 determination is best during periods of rhythm check when the LUCAS is paused.
- Immediately notify the family of the plan: make them aware of how long the crew will remain on scene and put them at ease by informing them your crew is doing everything the hospital would do. You may add that their loved one·s heart is not beating so its important that we not interrupt the efforts by transporting too soon.
- Be clear- If the patient is pronounced, use the words ´deadµ or ´diedµ so that they·re stressed mind can process appropriately.
- Invite them to say good-bye- if logistically feasible & safe, allow to say good-bye before terminating efforts. Prepare them for the last two minutes of resuscitative efforts.
- Allow grief to happen- it is the beginning of their healing

Post-Resuscitation (ROSC)

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- HCA Florida Osceola
- Orlando Health Dr. P. Phillips
- Advent Health Celebration
- Holmes Regional
- Heart of Florida
- Orlando Health Southlake
- Lawnwood
- Indian River

Follow General Approach to Cardiac Arrest Protocol if reassest

ROSC → Transport to PCI capable hospital

Obtain vital signs

- Maintain SpO2= 94-99%
  Avoid hyperventilation (ETCO2 35-45)
- Hypotension: NS Bolus 1 L (max 2L)
  Reassess lung sounds
  Proceed to vasopressor if fluid unresponsive or if signs of fluid overload
- Prepare Push Dose Pressor or Vasopressor drip and have ready to treat potential hypotension or bradycardia
- Persistent hypotension (SBP<90 adults): Push Dose Epinephrine 10mcg (1mL) q1-2 min. max 100mcg (10mL) as a bridge to Vasopressor Drip
- Norepinephrine: Start infusion at around 8-12 mcg/minute (30-45 gtt/min), titrated to maintain SBP > 90 mm Hg
- Maintain normothermia

Perform 12 lead EKG

Address reversible causes

- Hypoglycemia
- Hypoxia
- Hypothermia
- Hypovolemia
- Hydrogen Ion (acidosis)
- Hyperkalemia
- Tamponade
- Tension Pneumothorax
- Thrombosis
- Toxins

Continuous pulse checks, ETCO2 monitoring, & rhythm monitoring due to increased chances of re-arrest

**dsyrhythmias after cardiac arrest are common. If they persist, follow appropriate protocol*

PEARLS

- Mask available for BVM as back up in case advanced airway fails.
- Keep a finger on the pulse to quickly identify re-arrest. Utilize US for pulse checks as available.
- Titrate fluid resuscitation and vasopressor administration to maintain an adequate MAP.
- Treat Bradycardia, as it may precede re-arrest. Transcutaneous Pacing is not recommended as it prohibits proper monitoring for re-arrest.
- Reassess Supraglottic and Endotracheal tube placement via ETCO2 after every move, and at transfer of care.

EMS TO ED CARDIAC ARREST HANDOFF

Time 0 sec.	Time 0-30 sec.	Time 30 sec.	Time 30 sec.-2 min.	Time 2 min.	Time 4 min.
	"30 second silence"	Minimize compression interruptions		Less than 10 seconds	During 2nd pulse check (< 10 seconds pause)
EMS ARRIVAL	Silence for EMS report (Patient remains on EMS stretcher)	Pt transferred to hospital stretcher	Hospital interventions as needed	ED rhythm/pulse check	If EMS LUCAS utilized, switch to hospital LUCAS (w/ aid of EMS as needed)
No pause for pulse check until 2 min after arrival	Hospital prepares monitor connections	Hospital takes over BVM & manual compressions (if not connected to LUCAS)			Pt remains on EMS LUCAS board
					Hospital will provide the hospital's LUCAS board to EMS.

**Press suction release button on LUCAS after pausing to allow for removal*

EMS VERBAL REPORT

Demographics
- Relevant PMH
- Witnessed or unwitnessed?
- Downtime; CPR time
- Location of incident
- Signs of trauma?

Vitals
- Initial rhythm and ETCO2
- Rhythm change if any
- Change in ETCO2 if any
- Vitals if ROSC obtained

Interventions
- Airway
- IV/IO (location)
- How much Epinephrine given?
- How many shocks delivered?
- Amiodarone or Lidocaine?
- Bicarbonate or Calcium?

* Please provide family phone number & any advanced directives as available

PEARLS
- Maintain High Quality CPR throughout the transition
- Continue resuscitation on the EMS stretcher while giving the verbal report
- Assist with the LUCAS transfer as you may be more familiar with the equipment than hospital personnel

Shock

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Full ALS Assessment and Treatment

Evaluate for signs and symptoms of Shock

- Systolic BP <90 mm Hg
- HR >100
- Cool extremities
- Mottled skin appearance
- Pallor
- Delayed capillary refill
- Diaphoresis
- Altered mental status
- Shock Index >1 (HR/BP)

Evaluate for signs and symptoms of Shock

Distributive Shock (i.e. sepsis, anaphylaxis)	NS Bolus 1L IV/IO (repeat as needed) *Reassess lung sounds*	Push Dose Epinephrine 10mcg (1mL) q1-2 min. max 100mcg (10mL)
Cardiogenic Shock (i.e. Left Ventricular Failure, Right Ventricular Infarction)	Cautious 250ml NS Bolus IV/IO *Reassess lung sounds & repeat If improvement	Push Dose Epinephrine 10mcg (1mL) q1-2 min. max 100mcg (10mL)
Obstructive Shock (i.e. Tension Pneumothorax, Cardiac Tamponade, Pulmonary Embolism)	NS Bolus 1L IV/IO (repeat as needed) *Reassess lung sounds*	Push Dose Epinephrine 10mcg (1mL) q1-2 min. max 100mcg (10mL)
	*Utilize ultrasound as available to confirm diagnosis	
	Needle Decompression for Tension Pneumothorax	
Hypovolemic Shock (i.e. hemorrhage, dehydration)	NS Bolus 1L IV/IO (repeat as needed) *Reassess lung sounds*	Push Dose Epinephrine 10mcg (1mL) q1-2 min. max 100mcg (10mL)
	2g TXA if suspected cause is hemorrhagic (i.e. miscarriage, postpartum, epistaxis)	

Epistaxis- (topical only) 500mg soaked gauze

PEARLS

- Hypovolemic Shock- caused by decreased blood or water volume
- Distributive Shock: caused by vasodilation and/or increased permeability, redistributing blood flow
- Cardiogenic Shock: caused by pump failure
- Obstructive Shock: caused by an obstruction that interferes with blood return to the heart
- Norepinephrine may also be used as the vasopressor

Ventricular Assist Device (VAD & LVAD)

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Full ALS Assessment and Treatment including 12 lead EKG

***Contact the patient·s VAD coordinator immediately

Non-VAD issue
Treat according to standard protocols
Take all equipment associated with the device to the Emergency Department
Be careful not to cause any trauma to the site or driveline (wires)
Transport Destinations: Trauma Alert→ Trauma Center Stroke Alert→ Comprehensive Stroke Center STEMI Alert→ PCI Capable VAD center

Possible VAD issue: Look at the controller and identify which device is in place. Locate the colored sticker and match this to the EMS color coded guide.
Intervene appropriately based on the type of alarm and device. Consider: changing device batteries, reconnecting cables
Administer CPR in patients who meet all of the following: • unresponsive • apneic • BGL >60 • no pump sound • all cables connected & no alarms are sounding

Transport to patient·s VAD Center

PEARLS

- Patients with a properly functioning VAD may **not** have a detectable pulse, normal blood pressure, or oxygen saturation. Utilize ETCO2 and cap refill for assessment.
- An automated blood pressure cuff may be used to help obtain a mean arterial pressure (MAP). Goal: 60 -90 mmHg
- **LUCAS devices are contraindicated**
- Patients are preload dependent- administer 250ml NS bolus if signs of hypoperfusion
- VAD patients have an increased risk of bleeding due to long term anticoagulant therapy required for VADs
- VAD patients can be cardioverted and defibrillated as needed without any modifications
- CPR contraindicated if the device can be heard (humming sound). May cause internal hemorrhage to the patient

Chest pain- Suspected Ischemia

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Cardiac Emergencies

Full ALS Assessment and Treatment

Recognition:
- Evaluate for signs and symptoms of Ischemia including anginal equivalents: dyspnea, nausea, jaw pain, neck pain, dizziness
- 1st EKG: within 3 minutes of contact
- 2nd EKG: once patient is in the rescue
- 3rd EKG: prior to ED arrival

Improve Blood Flow:
- Administer Aspirin 324mg. Do not give if hx of allergy or active GI Bleeding

Pain Control & antiemetic as needed:
- Administer Nitroglycerin 0.4mg sublingual tablet
  - -Vascular access should be obtained prior to administration
  - -Do not administer in Inferior Wall MI
  - -Do not administer if SBP <100 mm Hg
  - -Do not administer if Phosphodiesterase-5 (PDE5) inhibitor within last 24 hours (Viagra or Levitra); 48 hours for Cialis
- *May repeat Nitroglycerin x 2 q 5 min w/ repeat assessment before & after administration*
- 1 mcg/kg Fentanyl max of 100 mcg slow IV/IO push, hold if SBP <100 (may repeat once; cumulative max 200 mcg)
- Zofran 4mg IV/IO

STEMI ALERT

Initiate STEMI Alert if **either** of the 2 are present:
1. Chest pain or anginal equivalent PLUS ST segment elevation • 1mm in two or more contiguous leads OR
2. Computer interpretation of ´Meets ST Elevation MI criteriaµ or similar wording on 12 lead ECG

Transmit EKG to receiving facility

During the radio call to the ED, convey the name of the patient's Cardiologist

PCI capable facilities:
HCA Florida Osceola Regional
Orlando Regional Medical Center
Advent Health Hospital Orlando
Advent Health Celebration
Dr. P. Phillips Hospital
Holmes Regional Medical Center
Heart of Florida Regional Medical Center
Lawnwood Medical Center
Southlake Hospital
Indian River Medical Center

Monitor for complications

Cardiogenic Shock (i.e. Left Ventricular Failure, Right Ventricular Infarction)	Cautious 250ml NS Bolus IV/IO	Push Dose Epinephrine 10mcg (1mL) q1-2 min. max 100mcg (10mL)
Unstable Bradycardia < 50	Transcutaneous Pacing (avoid Atropine)	
Sustained Ventricular Tachycardia > 150	Unstable: Synchronized Cardioversion	Stable: Amiodarone 150mg or Lidocaine 1mg/kg

PEARLS
- Aspirin is not contraindicated if Acute Coronary Syndrome suspected and taking Warfarin (Coumadin) or other anticoagulant or antiplatelet, unless active bleeding
- Isolated PVC·s do not require treatment. Sustained Ventricular Tachycardia (more than 4 beats) requires treatment
- Refer to appropriate protocol as needed for complications: Shock, Bradycardia, Ventricular Tachycardia

General Approach To Cardiac Arrest

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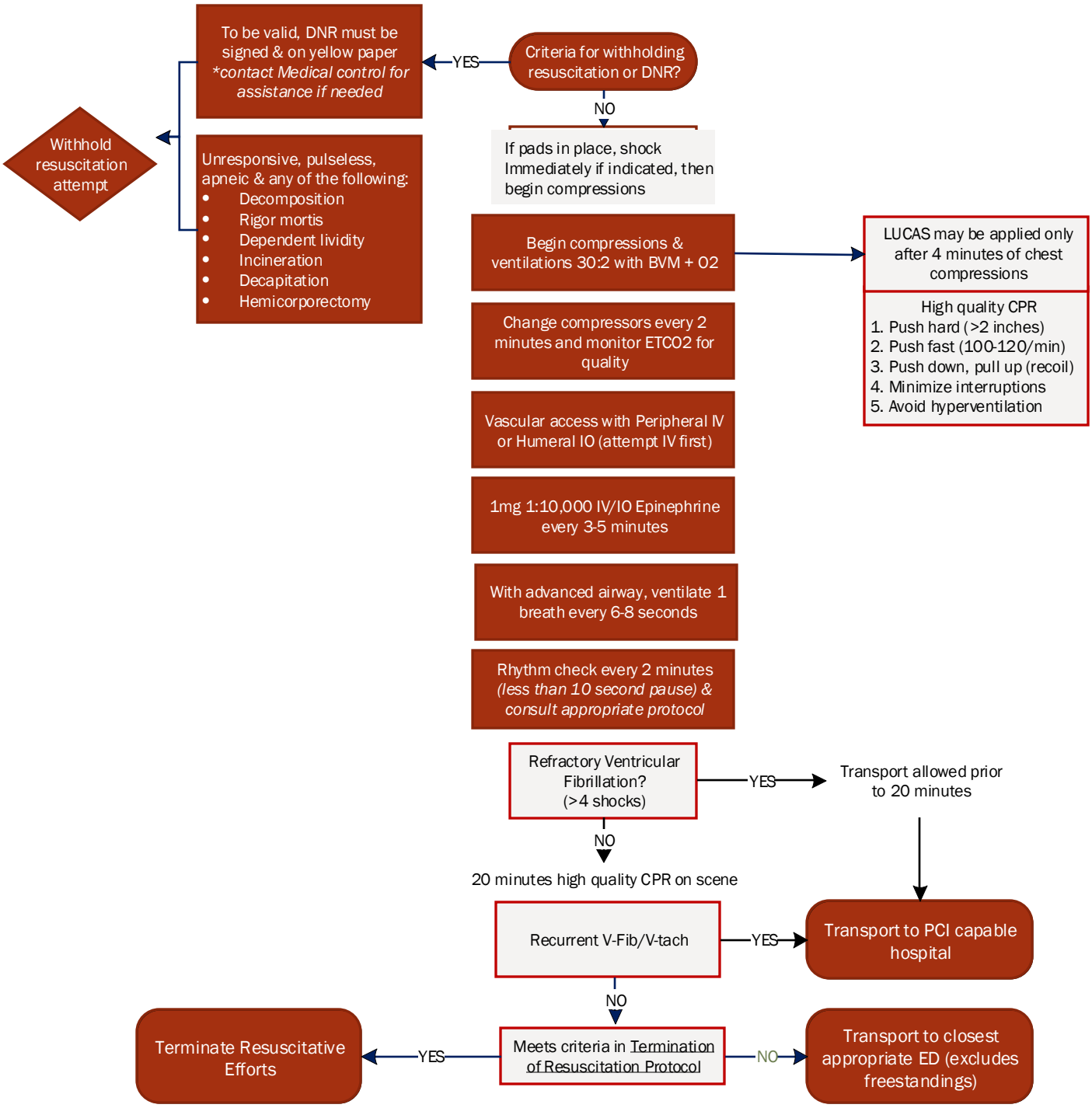

PEARLS

- Call ´Working Codeµ and ´First Shock Deliveredµ to Dispatch
- Transcutaneous Pacing is not indicated in cardiac arrest.
- When the scene is safe, ALL cardiac arrest resuscitation attempts should be worked **on scene** for 20 minutes prior to transport unless refractory v-fib or v-tach.
- Do not interrupt compressions to place an Endotracheal tube.
- IV/IO access & drug delivery is secondary to high-quality chest compressions and early defibrillation.
- Every minute delay in compressions decreases the chances of survival by ~10%
- Continue compressions while charging for defibrillation
- If ETCO2 <10 improve chest compressions
- Special Considerations
- Maternal arrest: >20 weeks gestation, manually displace the uterus to the left.
- Renal Failure/Dialysis patient: consider hyperkalemia
- Sodium Bicarbonate: no longer recommended as a standard cardiac arrest drug. Consider in dialysis, hyperkalemia, TCA & overdose and when specifically mentioned in protocol.

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Updates & Revisions

- 9/6/25 Shock- Topical route specified for TXA administration in nosebleeds with hemorrhagic shock
- 11/30/25 Termination of Resuscitation- communicate to Medical Control when there is cardiac standstill present (if US available)
- 11/30/25 Bradycardia- It is preferred to start with Epinephrine (push dose or drip) rather than TCP in post cardiac arrest as it is difficult to assess for pulses, which may lead to a delay in CPR
- 11/30/25 General Approach- clarification to shock immediately when indicated upon initiation of ACLS. A round of CPR is not required first if shockable rhythm identified.
- 11/30/25 AHA update- Starting cardioversion dose= 200J
- 11/20/25 AHA update- Defibrillation for Torsades rather than Magnesium first