

# ACLS PROTOCOLS

## CHEST PAIN / ACLS

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# CHEST PAIN / ACLS

## CHEST PAIN / ACUTE CORONARY SYNDROME

### UNIVERSAL PATIENT CARE PROTOCOL

OXYGEN >95% = 4 lpm NC <95% = 15 lpm NRB

Apply Cardiac Monitor obtain 12 lead and transmit

Evaluate 12 – Lead EKG  
(Look for ST Elevation)

### IV PROTOCOL

**NITROGLYCERIN**  
0.4 mg SL/Spray  
(If BP > 100 Systolic with IV - may give total of 3  
1 q 5 min)  
(EMT-B, Pt Assisted with Med Control)

**ASPIRIN**  
324 mg/ 325 mg PO

**MORPHINE SULFATE** 2 – 4 mg Slow IV q 5 min  
(Max = 10 mg if no relief with a total of 3 NTG)

Metoprolol 5 mg IV/IO if B/P >110 systolic + HR >60  
May Repeat in 3 minutes if B/P >110 + HR >60

**ST Elevation MI - Brilinta 180 mg PO**  
\*\*If Brilinta is not available - Plavix 600 mg PO\*\*

Reassess and Monitor

**Heprin 50units/kg max dose of 4000units IV**

**CONTACT MEDICAL CONTROL**

**TRANSPORT**

B	EMT – B	B
I	EMT – I	I
P	EMT – P	P
M	MED CONTROL	M

If arrhythmia exists go to appropriate  
Arrhythmia Protocol

If ST segment changes are found in Leads II, III and  
AVF (inferior wall) conduct a right side 12 lead EKG.  
  
Move V4 to right side of chest on the midclavicular line  
<same location as on the left> and run 12 lead again.  
Label 12 lead as "right side" look to V4 in the right  
side 12 lead for ST segment changes and notify ER

DO NOT give Nitroglycerin if patient has taken a  
Phosphodiesterase Inhibitors  
(ED enhancement drugs within 48 hours)

Give Zofran 4mg IV for nausea

Hypotension / Arrhythmia  
Treat per Appropriate Protocol

Consider Transport to a Facility  
With PCI Capabilities  
if Patient is Showing Signs of a  
ST Elevation MI

## CHEST PAIN / ACLS

### CHEST PAIN / ACUTE CORONARY SYNDROME

HISTORY	SIGNS AND SYMPTOMS	DIFFERENTIAL DIAGNOSIS
<ul style="list-style-type: none"> <li>• Age</li> <li>• Medications</li> <li>• Past medical history (MI, Angina, Diabetes)</li> <li>• Allergies</li> <li>• Recent physical exertion</li> <li>• Onset</li> <li>• Palliation / Provocation</li> <li>• Quality (crampy, constant, sharp, dull, etc.)</li> <li>• Region / Radiation / Referred</li> <li>• Severity (1-10)</li> <li>• Time (duration / repetition)</li> </ul>	<ul style="list-style-type: none"> <li>• CP (pain, pressure, aching, vice like tightness)</li> <li>• Location (substernal, epigastric, arm, jaw, neck, shoulder)</li> <li>• Radiation of pain</li> <li>• Pale, diaphoresis</li> <li>• Shortness of breath</li> <li>• Nausea, vomiting, dizziness</li> </ul>	<ul style="list-style-type: none"> <li>• Trauma vs. Medical</li> <li>• Angina vs. Myocardial infarction</li> <li>• Pericarditis</li> <li>• Pulmonary embolism</li> <li>• Asthma / COPD</li> <li>• Pneumothorax</li> <li>• Aortic dissection or aneurysm</li> <li>• GE reflux or hiatal hernia</li> <li>• Esophageal spasm</li> <li>• Chest wall injury or pain</li> <li>• Pleural pain</li> </ul>

### KEY POINTS

- All cardiac chest pain patients must have an IV, O<sub>2</sub> and monitor.
- Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro.
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- If positive ECG changes, establish a second IV while en route to the hospital.
- Monitor for hypotension after administration of nitroglycerin and morphine.
- Nitroglycerin and Morphine may be repeated per dosing guidelines in Appendix 1: Medications.
- Diabetics, women and geriatric patients often have atypical pain, or generalized complaints.
- Refer to the Sinus Bradycardia Protocol if indicated (HR < 60 bpm) or Wide & Narrow Complex Tachycardia Protocol (HR > 150 bpm) and hypotension.
- If the patient becomes hypotensive from Nitroglycerin administration, place the patient in the Trendelenburg position and administer a 250 ml Normal Saline bolus.
- Be prepared to administer Naloxone (Narcan) if the patient experiences respiratory depression or hypotension due to Morphine administration.
- If pulmonary edema is present, refer to the PULMONARY EDEMA/CHF PROTOCOL.
- Be suspicious of a "Silent MI" in the elderly, diabetics, and women.
- Consider other causes of chest pain such as aortic aneurysm, pericarditis, and pulmonary embolism.
- Aspirin can be administered to a patient on Coumadin unless the patient's physician has advised them otherwise.
- If the patient took a dose of Aspirin that was less than 325 mg in the last 24 hours, then additional Aspirin can be administered to achieve a therapeutic dose of 325 mg.
- DO NOT administer Nitroglycerin to a patient who took an erectile dysfunction medication (Viagra, Cialis, Levitra, etc) within the last 48 hours due to potential for severe hypotension.
- Nitroglycerin can be administered to a patient by EMS if the patient has already taken 3 of their own prior to your arrival. Document it if the patient had any changes in their symptoms or a headache after taking their own Nitroglycerin.
- Check and document the expiration date of the patient's prescribed Nitroglycerin.
- Nitroglycerin can be administered to a hypertensive patient complaining of chest discomfort without Medical Direction permission.
- Nitroglycerin can be administered without an IV as long as the patient takes Nitroglycerin at home and has a BP greater than 120 mmHg.
- All patients complaining chest discomfort must be administered at least 2lpm of oxygen by nasal cannula. Administer oxygen by non-rebreather or assist the patient's ventilations as indicated.

# ARRHYTHMIAS / ACLS

## SINUS BRADYCARDIA

B	EMT - B	B
I	EMT - I	I
P	EMT - P	P
M	MED CONTROL	M

UNIVERSAL PATIENT CARE PROTOCOL

Apply Cardiac Monitor / Obtain 12 lead EKG and transmit

IV PROTOCOL

Evaluate 12 - Lead EKG  
(Look for ST Elevation)

Hypotension, AMS, Chest Pain, Shock  
Blood Pressure < 90 Systolic

No

Yes

Monitor and Reassess

ATROPINE 0.5 mg (max 3mg)  
Repeat every 3-5 minutes  
DO NOT give if type II 2<sup>nd</sup> or 3<sup>rd</sup> degree heart

EXTERNAL TRANSCUTANEOUS PACING  
Start at 10 over the intrinsic rate and adjust for BP > 90

Consider DOPAMINE 2-10 mcg/kg/min  
Titrate to HR > 60 &  
BP > 90 systolic

Dopamine Simple calculation for approx 5 mcg/kg/min (must be 1600 mcg/ml concentration)  
\*Take the Patients weight in lbs and remove the last digit (175lbs = 17)  
\* Subtract 2 from that figure (17-2=15)  
\*This gives you the number of drops per min using a 60gtts set. (titrate to desired effect)  
Example: 175lbs patient. 175 remove the 5 is 17  
17 - 2 = 15 drops per min (approx 5 mcg/kg/min)

CONTACT MEDICAL CONTROL

TRANSPORT

# ARRHYTHMIAS / ACLS

## SINUS BRADYCARDIA

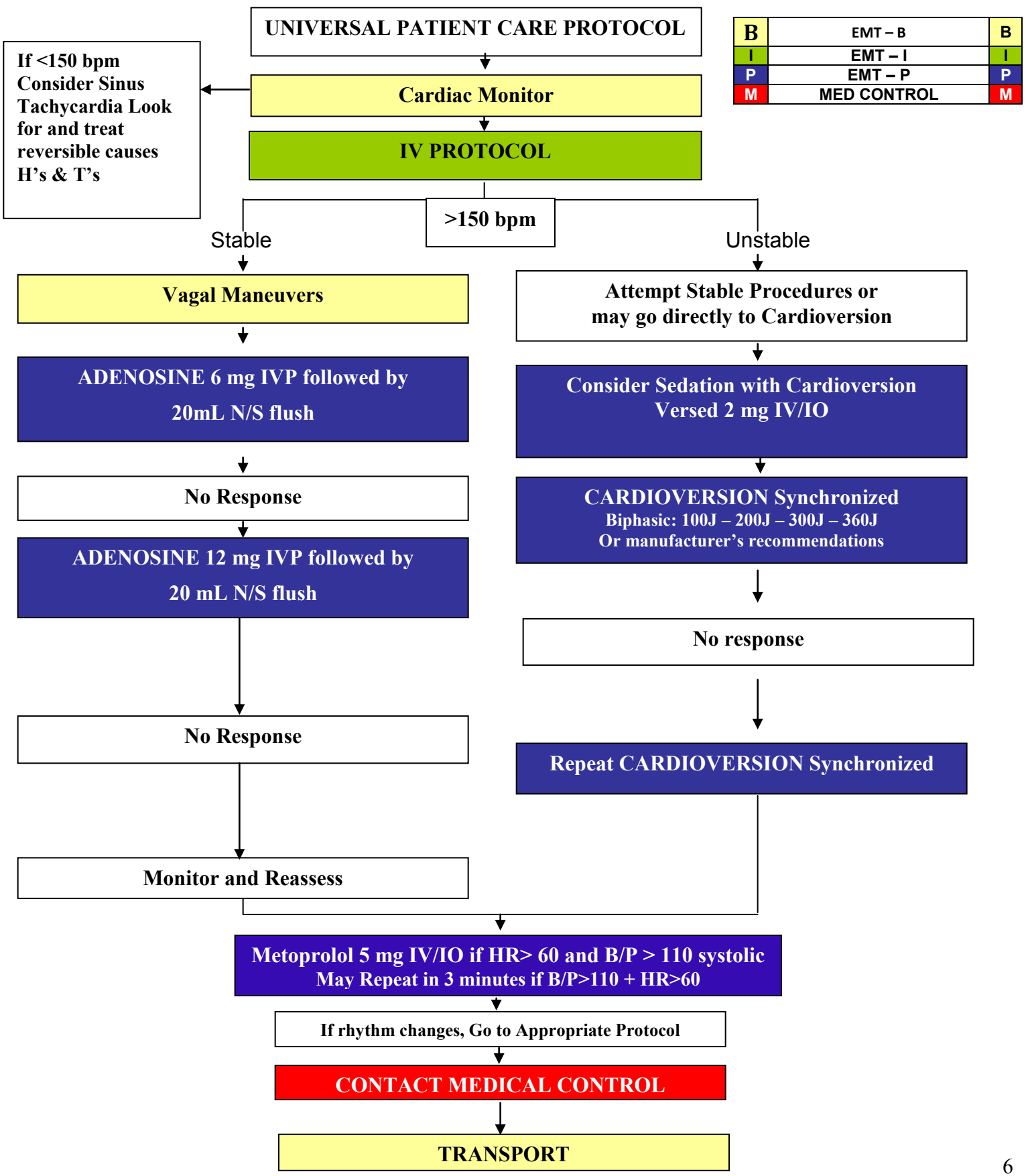
HISTORY	SIGNS AND SYMPTOMS	DIFFERENTIAL DIAGNOSIS
<ul style="list-style-type: none"><li>• Past medical history</li><li>• Medications<ul style="list-style-type: none"><li>• Beta-Blockers</li><li>• Calcium channel blockers</li><li>• Clonidine</li><li>• Digitalis</li></ul></li><li>• Pacemaker</li></ul>	<ul style="list-style-type: none"><li>• HR &lt; 60/min</li><li>• Chest pain</li><li>• Respiratory distress</li><li>• Hypotension or Shock</li><li>• Altered mental status</li><li>• Syncope</li></ul>	<ul style="list-style-type: none"><li>• Acute myocardial infarction</li><li>• Hypoxia</li><li>• Hypothermia</li><li>• Sinus bradycardia</li><li>• HOCM (Athletes)</li><li>• Head injury (elevated ICP) or Stroke</li><li>• Spinal cord lesion</li><li>• Sick sinus syndrome</li><li>• AV blocks (1°, 2°, or 3°)</li></ul>

### KEY POINTS

- Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro.
- The use of lidocaine in heart block can worsen bradycardia and lead to asystole and death.
- Pharmacological treatment of bradycardia is based upon the presence or absence of hypotension.
  - If hypotension exists, treat.
  - If blood pressure is adequate, monitor only.
- DO NOT administer Atropine, if the patient's rhythm is a Type II second-degree heart block or a third degree heart block.
- Transcutaneous pacing is the treatment of choice for Type II second-degree heart blocks and third degree heart blocks.
- If the patient is critical and an IV is not established, initiate pacing with Medical Direction permission.
- If the patient converts to another rhythm, refer to the appropriate protocol and treat accordingly.

# ARRHYTHMIAS / ACLS

## NARROW – COMPLEX TACHYCARDIA



# ARRHYTHMIAS / ACLS

## NARROW - COMPLEX TACHYCARDIA

HISTORY	SIGNS AND SYMPTOMS	DIFFERENTIAL DIAGNOSIS
<ul style="list-style-type: none"> <li>• Medications (Aminophylline, diet pills, thyroid supplements, decongestants, Digoxin)</li> <li>• Diet (caffeine, chocolate)</li> <li>• Drugs (nicotine, cocaine)</li> <li>• Past medical history</li> <li>• History of palpitations / heart racing</li> <li>• Syncope / near syncope</li> </ul>	<ul style="list-style-type: none"> <li>• HR &gt; 150/Min</li> <li>• QRS &lt; 0.12 Sec</li> <li>• Dizziness, CP, SOB</li> <li>• Potential presenting rhythm               <ul style="list-style-type: none"> <li>• Sinus tachycardia</li> <li>• PSVT</li> <li>• Atrial fibrillation / flutter</li> <li>• Multifocal atrial tachycardia</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Heart disease (WPW, Valvular)</li> <li>• Sick sinus syndrome</li> <li>• Myocardial infarction</li> <li>• Electrolyte imbalance</li> <li>• Exertion, Pain, Emotional stress</li> <li>• Fever</li> <li>• Hypoxia</li> <li>• Hypovolemia or anemia</li> <li>• Drug effect / Overdose</li> <li>• Hyperthyroidism</li> <li>• Pulmonary embolus</li> </ul>

### KEY POINTS

- Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro
- Adenosine may not be effective in identifiable atrial flutter/fibrillation, but is not harmful.
- Monitor for respiratory depression and hypotension associated with Versed.
- Continuous pulse oximetry is required for all patients.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- If the patient converts to another rhythm, refer to the appropriate protocol and treat accordingly.
- Examples of vagal maneuvers include bearing down, coughing, or blowing into a syringe. DO NOT perform a carotid massage.
- If possible, the IV should be initiated in either the left or right AC.
- When administering Adenosine follow the bolus with 20 ml rapid bolus of normal saline.
- Record EKG strips during Adenosine administration.
- Perform a 12-Lead EKG prior to and after Adenosine conversion or cardioversion of SVT.
- If the patient converts into ventricular fibrillation or pulseless ventricular tachycardia immediately DEFIBRILLATE the patient and refer to the appropriate protocol and treat accordingly.
- Give a copy of the EKGs and code summaries to the receiving facility upon arrival.

# ARRHYTHMIAS / ACLS

## WIDE – COMPLEX TACHYCARDIA

### UNIVERSAL PATIENT CARE PROTOCOL

B	EMT – B	B
I	EMT – I	I
P	EMT – P	P
M	MED CONTROL	M

**V-Fib  
Pulseless V-Tach  
Protocol**

**Palpate Pulse**

**Apply Cardiac Monitor**

**IV PROTOCOL**

Stable

Polymorphic

Unstable

Regular / Monomorphic

Consider Adenosine 6mg IV/IO  
May Consider additional Adenosine 12mg IV/IO

If V-Tach or uncertain rhythm  
**AMIODARONE**  
150 mg IV  
(Over 10 minutes)

Monitor and obtain 12-lead EKG  
Transmit to ED  
EMT-P Reassess for underlying rhythm  
Consider Synchronized Cardioversion with sedation

If (Polymorphic VT)  
torsades de pointes  
Consider Magnesium 1.0 – 2.0 grams IV  
Over 5 min

If V-Tach or uncertain rhythm  
**AMIODARONE**  
150 mg IV  
(Over 10 minutes)

**CONTACT MEDICAL CONTROL**

**TRANSPORT**

Prepare for immediate  
Cardioversion

Consider Sedation with Cardioversion  
Versed 2 mg IV/IO

**Synchronized CARDIOVERSION**  
Biphasic: 100J – 200J – 300J – 360J  
Or manufacturer's recommendations  
(If Polymorphic Defibrillate @ 200J)

**AMIODARONE**  
150 mg IV  
(Over 10 minutes)  
For Polymorphic Consider Magnesium Sulfate

# ARRHYTHMIAS / ACLS

## WIDE – COMPLEX TACHYCARDIA

HISTORY	SIGNS AND SYMPTOMS	DIFFERENTIAL DIAGNOSIS
<ul style="list-style-type: none"> <li>• Past medical history</li> <li>• Medications, diet, drugs</li> <li>• Syncope / near-syncope</li> <li>• Palpitations</li> <li>• Pacemaker</li> <li>• Allergies</li> </ul>	<ul style="list-style-type: none"> <li>• Ventricular tachycardia on ECG (Runs or sustained)</li> <li>• Conscious</li> <li>• Rapid pulse</li> <li>• Chest pain</li> <li>• Shortness of breath</li> <li>• Dizziness</li> <li>• Rate usually 150 - 180 bpm for sustained V-Tach</li> </ul>	<ul style="list-style-type: none"> <li>• Artifact / device failure</li> <li>• Cardiac</li> <li>• Endocrine / Metabolic</li> <li>• Drugs</li> <li>• Pulmonary</li> </ul>

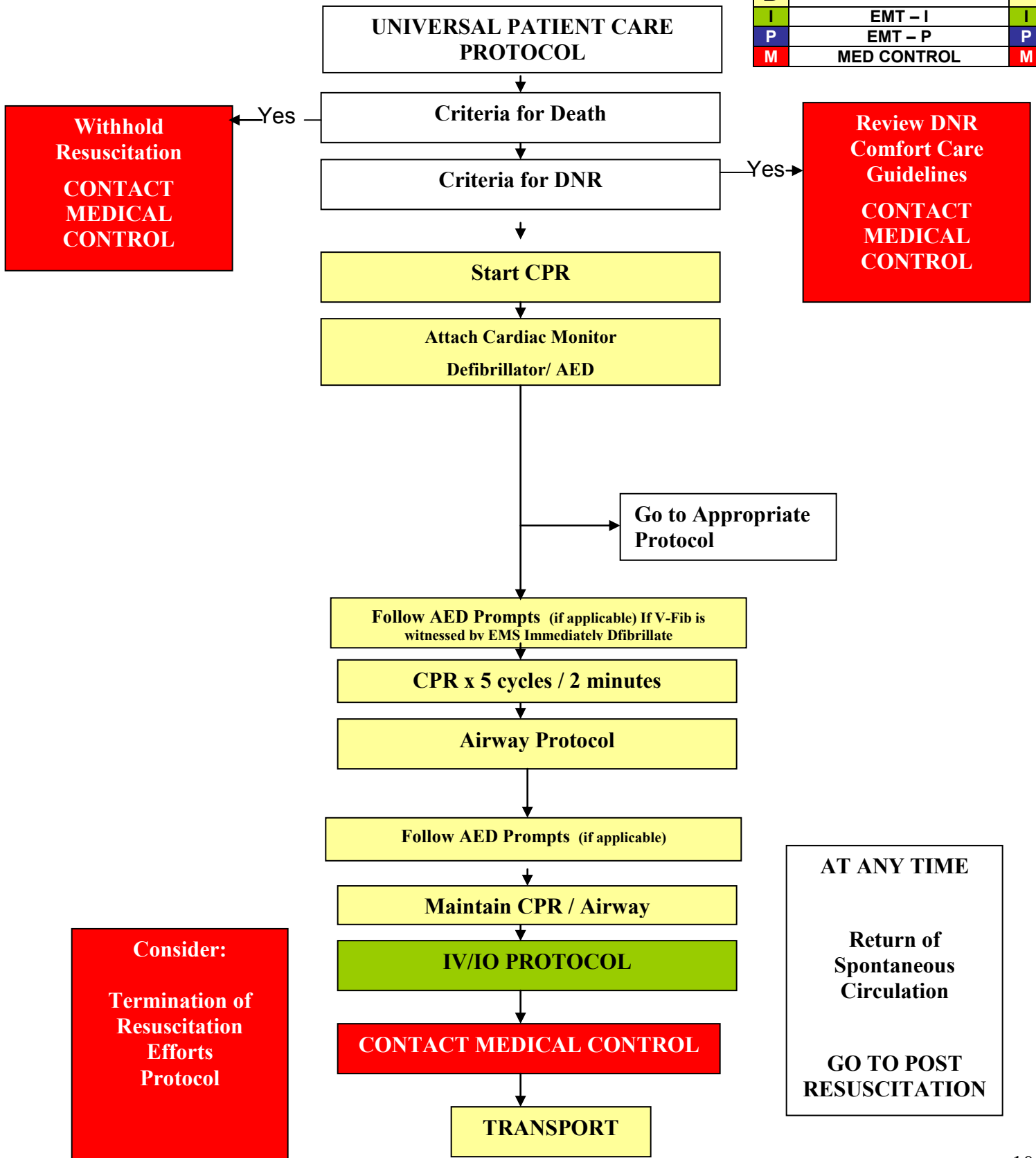
### KEY POINTS

- Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro.
- For witnessed / monitored ventricular tachycardia, try having patient cough or deliver a precordial thump.
- Polymorphic V-Tach (Torsades de Pointes) may benefit from the administration of magnesium sulfate and may require non-sync cardioversion.
- If the patient converts to another rhythm, refer to the appropriate protocol and treat accordingly.
- If the patient relapses back into wide complex tachycardia / ventricular tachycardia, initiate synchronized cardioversion with the joules setting that previously cardioverted the patient.
- Record EKG strips during Amiodarone administration.
- Perform a Code Summary and attach it to the patient run report.
- Be sure to treat the patient and not the monitor.

# CARDIAC ARREST / ACLS

## CARDIAC ARREST

B	EMT - B	B
I	EMT - I	I
P	EMT - P	P
M	MED CONTROL	M



# CARDIAC ARREST / ACLS

## CARDIAC ARREST

HISTORY	SIGNS AND SYMPTOMS	DIFFERENTIAL DIAGNOSIS
<ul style="list-style-type: none"> <li>• Events leading to arrest</li> <li>• Estimated down time</li> <li>• Past medical history</li> <li>• Medications</li> <li>• Existence of terminal illness</li> <li>• DNR or Living Will</li> </ul>	<ul style="list-style-type: none"> <li>• Unresponsive</li> <li>• Apneic</li> <li>• Pulseless</li> <li>• Signs of lividity, rigor mortis</li> </ul>	<ul style="list-style-type: none"> <li>• Medical vs Trauma</li> <li>• V-fib vs Pulseless V-tach</li> <li>• Asystole</li> <li>• Pulseless electrical activity (PEA)</li> </ul>

### KEY POINTS

- Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- If witnessed arrest – consider a precordial thump.
- Reassess airway frequently and with every patient move.
- Maternal Arrest - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport.
- If the patient converts to another rhythm, refer to the appropriate protocol and treat accordingly.
- Attempt to obtain patient history from family members or bystanders.
  - Estimated down time
  - Medical history
  - Complaints prior to arrest
  - Bystander CPR prior to EMS arrival
  - AED use prior to EMS arrival
- Administer Dextrose only if the patient has a Glucose Level < 70 mg/dl. Dextrose should be administered as soon a hypoglycemia is determined.
- DO NOT administer Narcan until the patient has been resuscitated and is known or suspected to have used narcotics.
- Reassess the patient if the interventions do not produce any changes.
- If indicated, refer to the Termination of Resuscitative Efforts Protocol.

# CARDIAC ARREST / ACLS

## ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)

UNIVERSAL PATIENT CARE PROTOCOL

B	EMT - B	B
I	EMT - I	I
P	EMT - P	P
M	MED CONTROL	M

**Withhold Resuscitation**  
**CONTACT MEDICAL CONTROL**

Criteria for Death

Criteria for DNR

**Review DNR Comfort Care Guidelines**  
**CONTACT MEDICAL CONTROL**

Start CPR

Airway Protocol

IV/ IO PROTOCOL

Apply Cardiac Monitor (AED)

## ASYSTOLE/PULSELESS ELECTRICAL ACTIVITY (PEA)

Resume CPR for 5 cycles

**End Stage Renal Pt. Consider:**  
**Calcium Chloride 1 gram (10cc) slow IVP & Sodium Bicarbonate 50mEq or 1mEq/kg IVP After 10 minutes of CPR DO NOT MIX IN SAME IV LINE**

**EPINEPHRINE**  
**1 mg IV / IO 1:10,000 Solution**  
**Repeat every 3- 5 minutes**  
**Or**  
**VASOPRESSIN 40 U IV / IO**  
**Give ONE Dose**

**AT ANY TIME**  
**Return of Spontaneous Circulation**  
**GO TO POST RESUSCITATION**

**Consider: Termination of Resuscitation Efforts**

**CONTACT MEDICAL CONTROL**

TRANSPORT

# CARDIAC ARREST / ACLS

## ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)

HISTORY	SIGNS AND SYMPTOMS	DIFFERENTIAL DIAGNOSIS
<ul style="list-style-type: none"> <li>• Past medical history</li> <li>• Medications                             <ul style="list-style-type: none"> <li>• Tricyclics</li> <li>• Digitalis</li> <li>• Beta blockers</li> <li>• Calcium channel blockers</li> </ul> </li> <li>• Events leading to arrest</li> <li>• End stage renal disease</li> <li>• Estimated down time</li> <li>• Suspected hypothermia</li> <li>• Suspected overdose</li> <li>• DNR or Living Will</li> </ul>	<ul style="list-style-type: none"> <li>• Pulseless</li> <li>• Apneic</li> <li>• No electrical activity on ECG</li> <li>• Cyanosis</li> </ul>	<ul style="list-style-type: none"> <li>• Medical or Trauma</li> <li>• Hypoxia</li> <li>• Potassium (hypo / hyper)</li> <li>• Acidosis</li> <li>• Hypothermia</li> <li>• Device (lead) error</li> <li>• Death</li> <li>• Hypovolemia</li> <li>• Cardiac tamponade</li> <li>• Drug overdose (Tricyclics, Digitalis, Beta blockers, Calcium channel blockers)</li> <li>• Massive Myocardial infarction</li> <li>• Tension pneumothorax</li> <li>• Pulmonary embolus</li> </ul>

### CONSIDER TREATABLE CAUSES

<ul style="list-style-type: none"> <li>• Hypovolemia</li> <li>• Hypoxia</li> <li>• Hydrogen ion (acidosis)</li> <li>• Hypo-hyperkalemia</li> <li>• Hypoglycemia</li> <li>• Hypothermia</li> </ul>	<ul style="list-style-type: none"> <li>• Tamponade, cardiac</li> <li>• Tension Pneumothorax</li> <li>• Thrombosis (coronary or pulmonary ACS or PE)</li> <li>• Trauma</li> <li>• Toxins</li> </ul>
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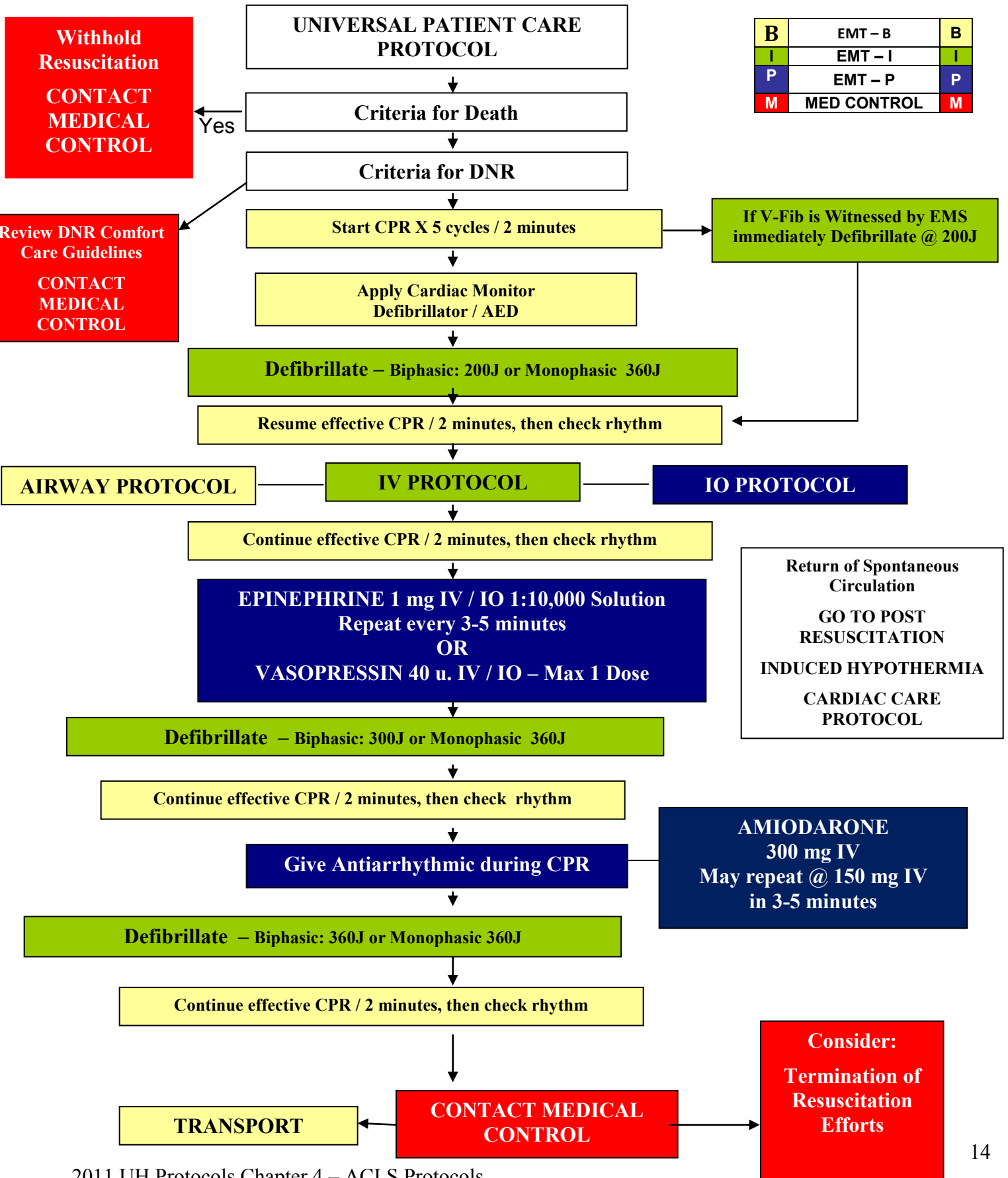
### KEY POINTS

<ul style="list-style-type: none"> <li>• Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro.</li> <li>• Always confirm asystole in more than one lead.</li> <li>• Consider each possible cause listed in the differential: Survival is based on identifying and correcting the cause!</li> <li>• Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options. Early identification and treatment of reversible causes of PEA increases the chance of a successful outcome.</li> <li>• If the patient converts to another rhythm, refer to the appropriate protocol and treat accordingly.</li> <li>• Consider volume infusion for all patients in PEA. Be alert for fluid overload.</li> <li>• Vasopressin is not repeated. If given, Epinephrine may be used 5 minutes after Vasopressin if still in arrest, 1mg of Epinephrine 1:10,000 would then be administered every 3-5 minutes.</li> <li>• Treat as ventricular fibrillation if you cannot differentiate between asystole and fine ventricular fibrillation.</li> <li>• Medical Direction must be contacted prior to administering antidotes for all poisonings/overdoses except for narcotic overdoses.</li> <li>• Dextrose 50% should only be administered to a patient with a confirmed blood glucose level less than 70 mg/dl.</li> </ul>
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# CARDIAC ARREST / ACLS

**VENTRICULAR FIBRILLATION (V – FIB)  
PULSELESS VENTRICULAR TACHYCARDIA (V – TACH)**

B	EMT – B	B
I	EMT – I	I
P	EMT – P	P
M	MED CONTROL	M



# CARDIAC ARREST / ACLS

## VENTRICULAR FIBRILLATION (V - FIB) PULSELESS VENTRICULAR TACHYCARDIA (V - TACH)

HISTORY	SIGNS AND SYMPTOMS	DIFFERENTIAL DIAGNOSIS
<ul style="list-style-type: none"><li>• Estimated down time</li><li>• Past medical history</li><li>• Medications</li><li>• Events leading to arrest</li><li>• Renal failure / dialysis</li><li>• DNR or living will</li></ul>	<ul style="list-style-type: none"><li>• Unresponsive</li><li>• Apneic</li><li>• Pulseless</li><li>• Ventricular fibrillation or ventricular tachycardia on EKG/monitor</li></ul>	<ul style="list-style-type: none"><li>• Asystole</li><li>• Artifact / device failure</li><li>• Cardiac</li><li>• Endocrine / Metabolic</li><li>• Drugs</li><li>• Pulmonary</li></ul>

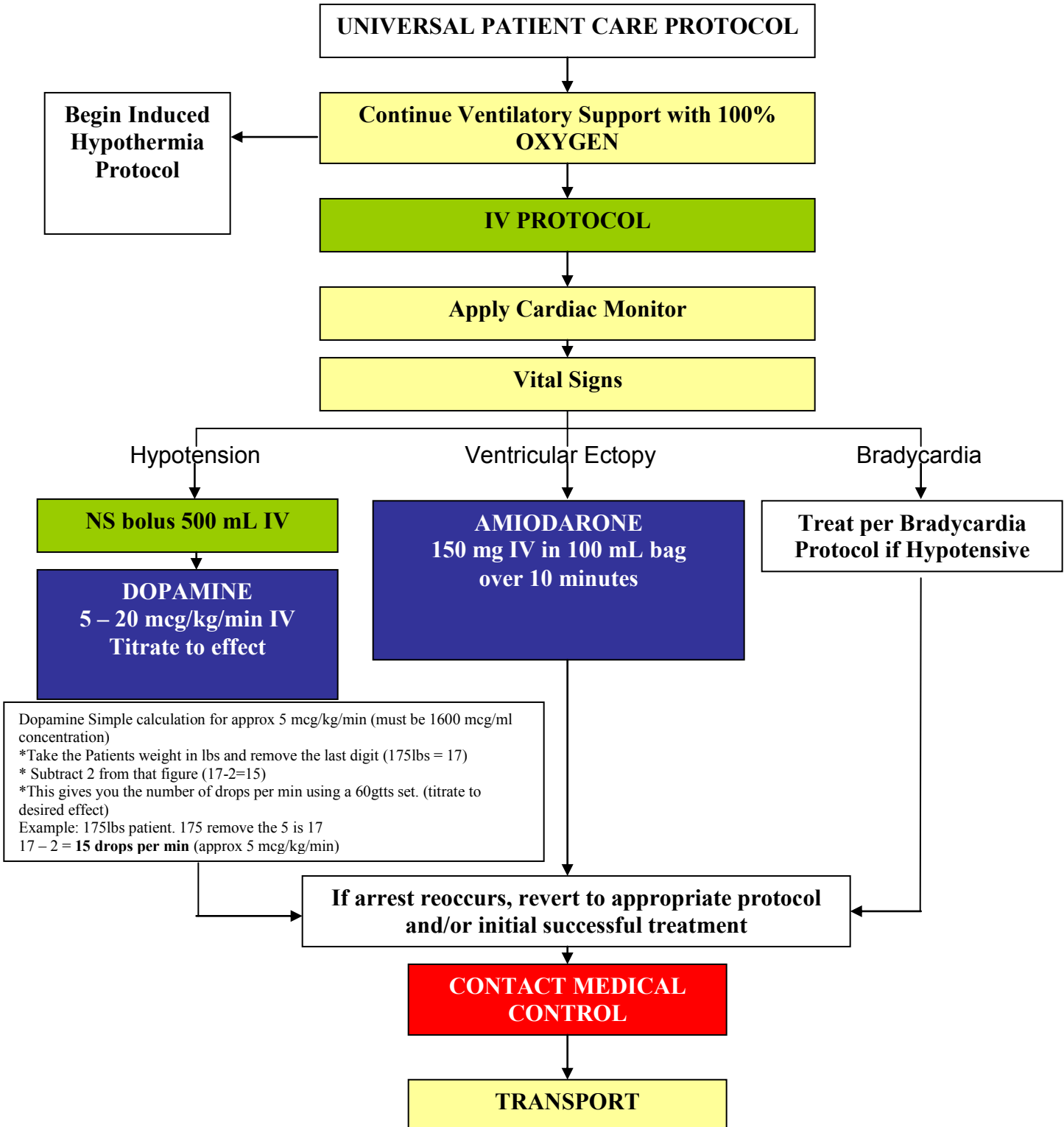
### KEY POINTS

- Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro.
- Effective CPR should be as continuous as possible with a minimum of 5 cycles or 2 minutes.
- Reassess and document endotracheal tube placement and ET CO<sub>2</sub> frequently: after every move, and at transfer.
- Polymorphic V-Tach (Torsades de Pointes) may benefit from administration of magnesium sulfate.
- If the patient converts to another rhythm, or has a return of circulation, refer to the appropriate protocol and treat accordingly.
- If the patient converts back to ventricular fibrillation or pulseless ventricular tachycardia after being converted to ANY other rhythm, defibrillate at the previous setting used.
- Defibrillation following effective CPR is the definitive therapy for ventricular fibrillation and pulseless ventricular tachycardia.
- Vasopressin is not repeated. If given, Epinephrine may be used 5 minutes after Vasopressin if still in arrest, 1mg of Epinephrine 1:10,000 would then be administered every 3-5 minutes.

# CARDIAC ARREST / ACLS

## POST – RESUSCITATION CARDIAC CARE

B	EMT – B	B
I	EMT – I	I
P	EMT – P	P
M	MED CONTROL	M



# CARDIAC ARREST/ ACLS

## POST - RESUSCITATION CARDIAC CARE

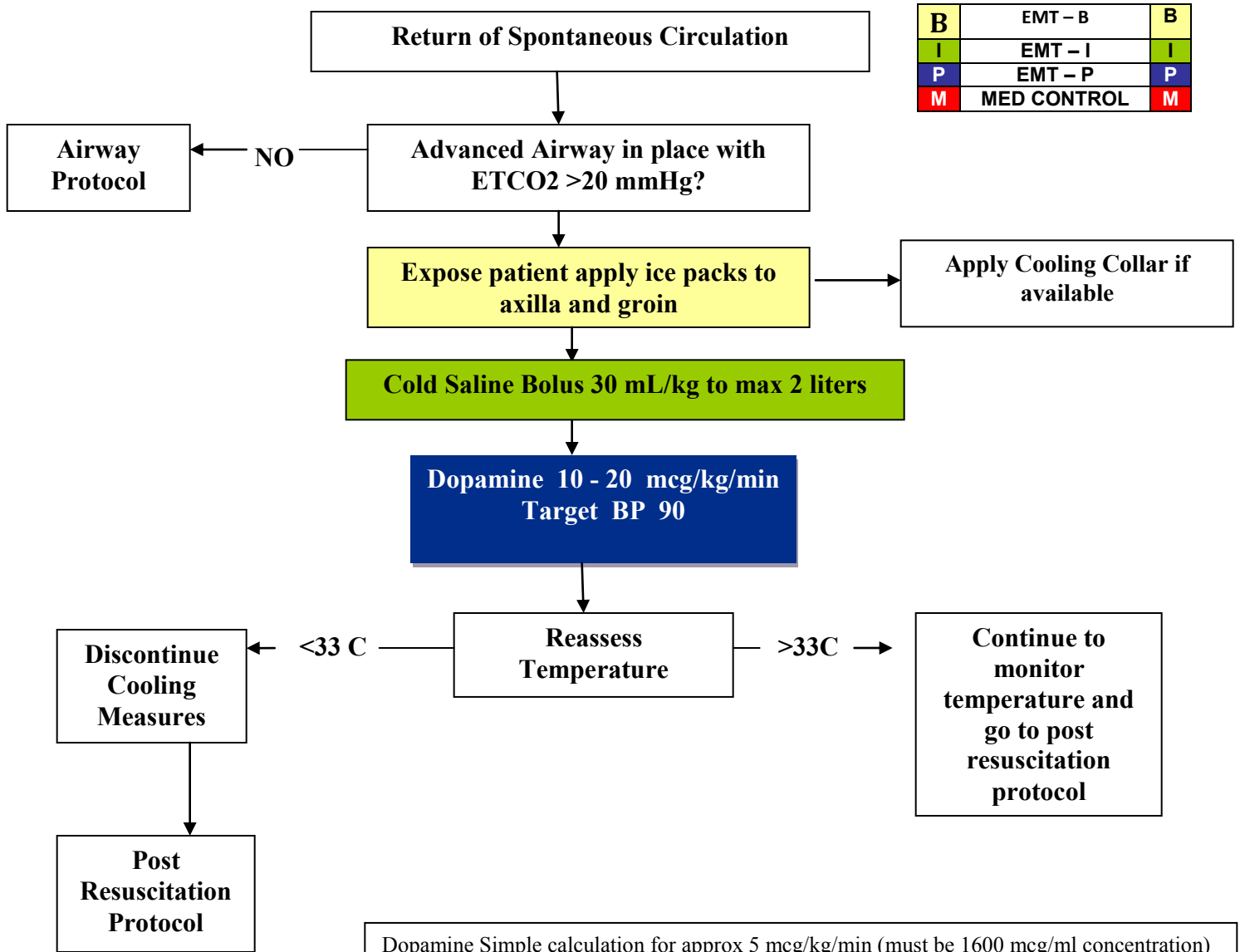
HISTORY	SIGNS AND SYMPTOMS	DIFFERENTIAL DIAGNOSIS
<ul style="list-style-type: none"><li>Respiratory arrest</li><li>Cardiac arrest</li></ul>	<ul style="list-style-type: none"><li>Return of pulse</li></ul>	<ul style="list-style-type: none"><li>Continue to address specific differentials associated with the original Arrhythmia</li></ul>

### KEY POINTS

- Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro.
- Most patients immediately post resuscitation will require ventilator assistance.
- The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring.
- Appropriate post-resuscitation management can best be planned in consultation with Medical Control.
- This is the period of time between restoration of spontaneous circulation and the transfer of care at the emergency department. The focus is aimed at optimizing oxygenation and perfusion.
- Adequate oxygenation is the key to a good outcome.

# CARDIAC ARREST / ACLS

## INDUCED HYPOTHERMIA



B	EMT - B	B
I	EMT - I	I
P	EMT - P	P
M	MED CONTROL	M

Dopamine Simple calculation for approx 5 mcg/kg/min (must be 1600 mcg/ml concentration)  
 \*Take the Patients weight in lbs and remove the last digit (175lbs = 17)  
 \* Subtract 2 from that figure (17-2=15)  
 \*This gives you the number of drops per min using a 60gtts set. (titrate to desired effect)  
 Example: 175lbs patient. 175 remove the 5 is 17  
 17 - 2 = 15 drops per min (approx 5 mcg/kg/min)

# CARDIAC ARREST/ ACLS

## INDUCED HYPOTHERMIA

HISTORY	SIGNS AND SYMPTOMS	DIFFERENTIAL DIAGNOSIS
<ul style="list-style-type: none"><li>Non-traumatic cardiac arrest (drowning and hanging are permissible in this protocol)</li></ul>	<ul style="list-style-type: none"><li>Return of pulse</li></ul>	<ul style="list-style-type: none"><li>Continue to address specific differentials associated with the original Arrythmia</li></ul>

### KEY POINTS

- Criteria for Induced Hypothermia
- ROSC not related to blunt/penetrating trauma or hemorrhage
- Age 12 or older with adult body habitus
- Advanced airway in place with no purposeful response to pain
- If no advanced airway can be obtained, cooling may only be initiated on order from online medical control
- Take care to protect patient modesty. Undergarments may remain in place during cooling.
- Do not delay transport to cool
- Frequently monitor airway, especially after each patient move
- Patients may develop metabolic alkalosis with cooling. Do not hyperventilate

**MEDICATIONS****ADENOSINE (*Adenocard*)****P****EMT – P****P**

<b>ACTIONS</b>	Slows conduction time and can interrupt re-entrant pathways through the AV node Slows the sinus rate
<b>INDICATIONS</b>	Supra Ventricular Tachycardia (SVT) Consider in Regular Wide Complex Tachycardia Paroxysmal Supra Ventricular Tachycardia (PSVT) Wolf Parkinson White (WPW)
<b>CONTRAINDICATIONS</b>	Second or third degree AV block, sick sinus syndrome Atrial fibrillation Atrial flutter Ventricular tachycardia Hypersensitivity to Adenosine
<b>PRECAUTIONS</b>	It is helpful to inform the patient of likely side effects prior to medication administration
<b>SIDE EFFECTS</b>	Facial flushing Shortness of breath Chest pain Palpitations Brief period of sinus arrest /Transient Dysrhythmias Headache Lightheadedness Hypotension Nausea
<b>ADULT DOSAGE</b>	<b><u>Initial Dose</u></b> 6 mg rapid IVP (over 1-3 sec) immediately followed with a 20 mL saline flush <b><u>Repeat Dose</u></b> If no response is observed after 1 min., administer 12 mg rapid IVP (over 1-3 sec) immediately followed with a 20 mL saline flush. Max dose 30 mg
<b>PEDIATRIC DOSAGE</b>	<b><u>Initial Dose</u></b> 0.1 mg/kg rapid IVP followed with a 10 mL saline flush <b><u>Repeat Dose</u></b> If no response is observed after 1-2 min., administer 0.2 mg/kg rapid IVP followed with a 10 mL saline flush. Max dose 0.5 mg/kg up to 6mg
<b>KEY POINTS</b>	<ul style="list-style-type: none"> <li>• Adenosine has a short half life, and should be administered rapidly followed by a rapid IV/IO flush</li> <li>• Reassess after each medication administration, refer to the appropriate protocol and treat accordingly.</li> <li>• Perform a 12 Lead EKG prior to the administration of Adenosine and after the rhythm converts</li> <li>• Record rhythm during and post administration</li> </ul>

**MEDICATIONS**

**AMIODARONE (Cordarone)**

P EMT – P P

<i>ACTIONS</i>	Prolongs the refractory period and action potential duration
<b>INDICATIONS</b>	Ventricular Fibrillation (refractory to shock treatment) Pulseless Ventricular Tachycardia (refractory to shock treatment) Polymorphic VT and wide complex tachycardia
<b>CONTRAINDICATIONS</b>	Hypersensitivity (including iodine) Cardiogenic shock Second and Third degree AV block Severe sinus bradycardia Severe sinus node dysfunction
<b>PRECAUTIONS</b>	
<b>SIDE EFFECTS</b>	Tremors, Paresthesia, Ataxia Headache, Fatigue Abdominal pain, Nausea/Vomiting, Hepatic failure Arrhythmia, Bradycardia, Sinus arrest, Heart block (Prolonged QT), Heart failure Acute Respiratory Distress Syndrome, Severe pulmonary edema Blue-Gray skin
<b>ADULT DOSAGE</b>	<b><u>Ventricular Fibrillation and Pulseless Ventricular Tachycardia</u></b> 300 mg IV/IO bolus Repeat Dose: 150 mg IV/IO in 3-5 minutes, Max 2.2 g IV/24hrs  <b><u>Wide Complex Tachycardia</u></b> 150 mg IV/IO over 10 minutes (15 mg/min) Repeat Dose: 150 mg IV/IO every 10 minutes prn, Max 2.2 g IV/24hrs
<b>PEDIATRIC DOSAGE</b>	<b><u>Ventricular Fibrillation and Pulseless Ventricular Tachycardia</u></b> 5 mg/kg IV/IO bolus  <b><u>Ventricular Arrhythmias</u></b> Loading dose – 5 mg/kg IV/IO over 30-60 mins
<b>KEY POINTS</b>	<ul style="list-style-type: none"> <li>• Avoid excessive movement and shaking of the medication</li> </ul>

<b>MEDICATIONS</b>
<b>ASPIRIN</b>

<b>B</b>	EMT – B	<b>B</b>
<b>I</b>	EMT – I	<b>I</b>
<b>P</b>	EMT – P	<b>P</b>

<i>ACTIONS</i>	Blocks platelet aggregation
<b>INDICATIONS</b>	Chest pain suggestive of a MI 12-Lead EKG indicating a possible MI
<b>CONTRAINDICATIONS</b>	Hypersensitivity Active ulcer disease Impaired renal function
<b>PRECAUTIONS</b>	Upset stomach
<b>SIDE EFFECTS</b>	GI bleeding Mucosal lesions Bronchial spasm in some asthma patients
<b>SUPPLIED</b>	325 mg tablet or 81 mg chewable tablet
<b>ADULT DOSAGE</b>	325 mg tablet or 324 mg (81 mg x 4 tablets) PO

**MEDICATIONS****ATROPINE SULFATE****P****EMT – P****P**

<b>ACTIONS</b>	Increases sinus node firing Increases conduction through the AV node by blocking vagal activity Increases cardiac output Decreases ectopic beats or fibrillation of the ventricles
<b>INDICATIONS</b>	Symptomatic sinus bradycardia Organophosphate poisoning/Nerve agent exposure
<b>CONTRAINDICATIONS</b>	Known hypersensitivity Atrial flutter/fibrillation where there is a rapid ventricular response Glaucoma – narrow angle 2 <sup>nd</sup> and 3 <sup>rd</sup> degree AV Block with wide QRS complex
<b>PRECAUTIONS</b>	Use with extreme caution in myocardial infarction May increase myocardial oxygen demand May trigger tachy-dysrhythmias Patient needs to be warned about side effects Doses smaller than 0.5 mg or administered too slowly may slow rather than speed up the heart rate Excessive doses in adults may precipitate ventricular tachycardia or fibrillation
<b>SIDE EFFECTS</b>	Dry mouth, thirst, urinary retention Blurred vision, pupillary dilation, headache Flushed skin Tachycardia
<b>SUPPLIED</b>	Prefilled syringes containing 1 mg in 10 mL Auto-Injector containing 2 mg (nerve agent exposure only)
<b>ADULT DOSAGE</b>	<b><u>Bradycardia</u></b> 0.5 mg IV/IO (1.0 mg ETT) every 5 minutes Max dose 0.04 mg/kg or 3 mg <b><u>Organophosphate Poisoning</u></b> 2 – 5mg IVP, IM, or IO every 5 min
<b>PEDIATRIC DOSAGE</b>	<b><u>Bradycardia</u></b> 0.02 mg/kg IV/IO, repeated X 1, 5 minutes (minimum dose 0.1 mg), Max single dose 0.5 mg CHILD / 1.0 mg ADOLESCENT, Max total dose 1.0 mg CHILD / 2.0 mg ADOLESCENT <b><u>Organophosphate Poisoning</u></b> 0.5 mg/kg IV/IO, repeat every 3-5 minutes

**MEDICATIONS****BiCarbonate (Sodium BiCarbonate)****P** **EMT – P** **P**

<i>ACTIONS</i>	Buffers metabolic acidosis Enhances the urinary excretion of tricyclics
<b>INDICATIONS</b>	Metabolic Acidosis from cardiac arrest (10 minutes down time) Tricyclic Overdose Hyperkalemia
<b>CONTRAINDICATIONS</b>	Heart Failure Seizures
<b>SIDE EFFECTS</b>	Tissue necrosis if infiltration Can precipitate with Calcium
<b>ADULT DOSAGE</b>	50mEq IVP for tricyclic overdose 50mEq or 1mEq/kg IVP for cardiac arrest – asystole or PEA 50 mEq IVP for cardiac arrest with prolonged down time(10 minutes)

**MEDICATIONS****BRILINTA (ticagrelor)****P****EMT – P****P**

<i>ACTIONS</i>	A P2Y <sub>12</sub> platelet inhibitor indicated to reduce the rate of thrombotic cardiovascular events in patients with acute coronary syndrome,
<b>INDICATIONS</b>	Acute Coronary Syndrome / STEMI 12-Lead EKG indicating a ST elevation MI
<b>CONTRAINDICATIONS</b>	History of intracranial hemorrhage Active pathological bleeding Severe hepatic impairment
<b>PRECAUTIONS</b>	Increased risk of bleeding Dyspnea
<b>SIDE EFFECTS</b>	Bleeding Dyspnea
<b>ADULT DOSAGE</b>	180mg PO (2 – 90mg Tablets)

**MEDICATIONS****CALCIUM CHLORIDE****P****EMT – P****P**

<i>ACTIONS</i>	Reverses overdose with magnesium sulfate or calcium channel blockers (such as verapamil)
<b>INDICATIONS</b>	Antidote – magnesium sulfate and calcium channel blocker toxicity Hyperkalemia Beta Blocker overdose Known dialysis patient in cardiac arrest
<b>CONTRAINDICATIONS</b>	Hypersensitivity to calcium chloride
<b>PRECAUTIONS</b>	Do not infuse with sodium bicarbonate – will combine to form an insoluble precipitate Can cause ventricular fibrillation when pushed too fast or given to a patient who has been taking digitalis
<b>SIDE EFFECTS</b>	
<b>ADULT DOSAGE</b>	1 gram (10cc) slow IVP
<b>KEY POINTS</b>	<ul style="list-style-type: none"> <li>Previously, calcium was used in resuscitation because it was believed to stimulate the heart to beat in asystole and to strengthen cardiac contractions in electromechanical dissociation – careful recent studies have failed to show any benefit from using calcium in cardiac arrest, and indeed the effects of calcium may be harmful in that situation</li> </ul>

<b>MEDICATIONS</b>
<b>DOPAMINE (Intropine)</b>

P	EMT – P	P
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<b>ACTIONS</b>	Alpha and beta adrenergic receptor stimulator Dopaminergic receptor stimulator Dilates renal and mesenteric blood vessels Vasoconstriction Arterial resistance Increases cardiac output Increases preload
<b>INDICATIONS</b>	Cardiogenic shock Distributive Shock Cyanide poisoning (contact Medical Control)
<b>CONTRAINDICATIONS</b>	Known hypersensitivity /Allergy Hypovolemic hypotension VF or VT
<b>PRECAUTIONS</b>	Do not mix with bicarbonate, dopamine may be inactivated by alkaline solutions Extravasation may cause tissue necrosis
<b>SIDE EFFECTS</b>	Ectopic beats, palpitations Tachycardia, angina Nausea/vomiting VF or VT Dyspnea Headache
<b>ADULT DOSAGE</b>	2 -20mcg/kg/min IV drip. Start 5 micrograms/kg/minute IV/IO infusion, titrate to effect

Simple calculation for approx 5 mcg/kg/min (must be 1600 mcg/ml concentration)  
 \*Take the Patients weight in lbs and remove the last digit (175lbs = 17)  
 \* Subtract 2 from that figure (17-2=15)  
 \*This gives you the number of drops per min using a 60gtts set. (titrate to desired effect)

Example: 175lbs patient.  
 175 remove the 5 is 17  
 17 – 2 =**15 drops per min** (approx 5 mcg/kg/min)

<b>MEDICATIONS</b>							
<b>EPINEPHRINE (Adrenaline)</b>							
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I	EMT – I	I					
P	EMT – P	P					
<b>ACTIONS</b>	Alpha and Beta adrenergic agonist Bronchodilation Increases heart rate and automaticity Increases cardiac contractility Increases myocardial electrical activity Increases systemic vascular resistance Increases blood pressure						
<b>INDICATIONS</b>	Cardiac arrest Allergic reaction/Anaphylaxis Respiratory distress Acute Asthma Pediatric Bradycardia						
<b>CONTRAINDICATIONS</b>	Hypersensitivity Tachycardia Hypertension Hypothyroidism Angina / Chest pain Coronary artery disease						
<b>PRECAUTIONS</b>	Pregnancy Blood pressure, pulse, and EKG must be routinely monitored						
<b>SIDE EFFECTS</b>	Palpitations, ectopic beats, tachycardia Anxiety / Tremors Hypertension VF / VT Angina						
<b>ADULT DOSAGE</b>	<p><b><u>Asthma and Anaphylaxis</u></b>            Mild Reaction (1-1,000) 0.3-0.5mg SQ            Consider 1:1000 2mg mixed with 1ml NS in nebulizer for Asthma</p> <p><b><u>Severe Anaphylaxis</u></b>            (1:10,000) 0.5 mg slow IV/IO over 5 minutes - EMT-P Only</p> <p><b><u>Cardiac Arrest</u></b>            1:10,000 1 mg IV/IO every 3-5 minutes – EMT-P Only</p>						
<b>PEDIATRIC DOSAGE</b>	<p><b><u>Asthma and Anaphylaxis</u></b>            Mild Reaction Ages 10-16 yrs (1:1,000) 0.03 mg/kg SQ            Under 10 yrs (1:1,000) 0.01mg/kg SQ            May use 1:1000 2mg mixed with 1ml NS in nebulizer aerosolized</p> <p><b><u>Severe Anaphylaxis Pending Arrest</u></b>            Ages 10-16 yrs (1:10,000) 0.01mg/kg IV/IO over 5 minutes – EMT-P Only</p> <p><b><u>Cardiac Arrest</u></b>            1:10,000 0.01 mg/kg IV/IO push 0.1ml/kg – EMT-P Only            or            0.1 mg/kg 1:1000 ETT 0.1ml/kg – EMT-P Only</p>						
<b>KEY POINTS</b>	<p><b>Administer SQ dose prior to contacting Medical Direction. IV dose in non-cardiac patient consult Medical Direction</b></p>						

**MEDICATIONS****HEPARIN****P EMT – P P**

<i>ACTIONS</i>	Anticoagulant
<b>INDICATIONS</b>	Acute Coronary Syndrome LVAD malfunction
<b>CONTRAINDICATIONS</b>	Hypersensitivity to Heparin Active bleeding Trauma Severe hypertension Aortic dissection Pregnancy Major surgery within the last 14 days Symptoms of CVA
<b>SIDE EFFECTS</b>	Bleeding
<b>ADULT DOSAGE</b>	<b>50 units/kg IV</b> <b>Maximum dose (4000 units)</b>
<b>KEY POINTS</b>	

<b>MEDICATIONS</b>
<b>LOPRESSOR (Metoprolol)</b>

P	EMT – P	P
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<b>ACTIONS</b>	Beta Blocker Decreases HR Decreases systolic BP
<b>INDICATIONS</b>	Chest Pain with BP > 110 systolic HR >60 AMI to reduce myocardial ischemia Convert or slow ventricular response in SVT (adenosine preferred) Rate Control in SVT that will not convert
<b>CONTRAINDICATIONS</b>	Bronchial asthma CHF Second or third degree heart block Bradycardia Vardiogenic shock Cocaine use
<b>SIDE EFFECTS</b>	Bradycardia Heart block CHF Bronchospasm Hypotension
<b>ADULT DOSAGE</b>	5 mg IV/IO over 1 minute. May repeat 5 mg after 3 minutes if inadequate response and B/P>110 and HR>60
<b>KEY POINTS</b>	

<b>MEDICATIONS</b>
<b>MAGNESIUM SULFATE</b>

P	EMT – P	P
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<i>ACTIONS</i>	Anticonvulsant Antiarrhythmic CNS depressant
<b>INDICATIONS</b>	Seizures secondary to eclampsia Ventricular ectopy refractory to Amiodarone Torsades Adjunct to alleviate acute asthma attack
<b>CONTRAINDICATIONS</b>	Renal disease Heart blocks
<b>SIDE EFFECTS</b>	Respiratory depression CNS depression Hypotension Cardiac arrest
<b>ADULT DOSAGE</b>	1.0 – 4.0 grams SLOW IVP over 2-3 minutes (Max dose 4 grams  Asthma dose 45mg/kg IV to a total of 75mg/kg
<b>KEY POINTS</b>	

Approx Mag Dose	
Child < 10	1 gram
Child 10 16	1 to 2

<b>MEDICATIONS</b>		
<b>MORPHINE SULFATE</b>		

I	EMT – I	I
P	EMT – P	P

<i>ACTIONS</i>	Narcotic Analgesic Causes peripheral vasodilation
<b>INDICATIONS</b>	Pulmonary edema MI pain unrelieved with nitro Pain management Pain secondary to burns
<b>CONTRAINDICATIONS</b>	Known hypersensitivity / Allergy Head injury or head trauma Hypotension Altered LOC Undiagnosed abdominal pain(consult Med Command) COPD Bradycardia Multiple trauma patients
<b>PRECAUTIONS</b>	If the patient responds with respiratory depression or hypotension, administer Narcan to reverse the effects Routinely monitor the patient’s respiratory effort and SpO <sub>2</sub>
<b>SIDE EFFECTS</b>	Respiratory depression Altered LOC, constricted pupils Bradycardia Nausea/Vomiting Hypotension
<b>ADULT DOSAGE</b>	2-4 mg slow IV/IO, Intranasal (If no relief, may repeat at 2 to 4 mg) <b>For further doses over 10mg of Morphine, contact medical direction.</b>  Follow with 4mg Zofran
<b>PEDIATRIC DOSAGE</b>	<b><u>Pain Management:</u></b> 0.1-0.2 mg/kg slow IV, IM, SQ
<b>KEY POINTS</b>	

<b>EDICATIONS</b>
<b>NITROGLYCERIN</b>

I	EMT – I	I
P	EMT – P	P

<i>ACTIONS</i>	Decreases preload and afterload Increases coronary blood flow
<b>INDICATIONS</b>	Cardiac chest discomfort, angina STEMI Pulmonary edema
<b>CONTRAINDICATIONS</b>	Known hypersensitivity Hypotension (systolic BP <110, diastolic BP <60) Increased intracranial pressure Glaucoma CVA Erectile dysfunction drugs ( <b>contact med control</b> )
<b>SIDE EFFECTS</b>	Headache Hypotension Dizziness, weakness Syncope Dilated pupils
<b>ADULT DOSAGE</b>	<b><u>Cardiac Chest Discomfort</u></b> 0.4 mg SL or spray May repeat every 5 minutes up to 3 doses if B/P systolic > 90mmHg  <b><u>Pulmonary Edema with systolic BP &gt;200</u></b> 1.2mg SL (3 tablets simultaneously)
<b>PEDIATRIC DOSAGE</b>	Not recommended in the prehospital setting
<b>KEY POINTS</b>	

**MEDICATIONS****Plavix (CLOPIDOGREL)****P****EMT – P****P**

<b>ACTIONS</b>	Blocks platelet aggregation
<b>INDICATIONS</b>	Acute Coronary Syndrome / STEMI 12-Lead EKG indicating a ST elevation MI
<b>CONTRAINDICATIONS</b>	Hypersensitivity Active bleeding Active ulcer disease Pathological bleeding
<b>PRECAUTIONS</b>	Upset stomach
<b>SIDE EFFECTS</b>	Nose bleeds, coughing up Chest pains Numbness in body, weakness GI bleeding Mucosal lesions
<b>ADULT DOSAGE</b>	600 mg tablet PO

## MEDICATIONS

### VASOPRESSIN (*Pitressin*)

P      EMT – P      P

<b>ACTIONS</b>	Alpha agonist Causes vasoconstriction Increases smooth muscle activity
<b>INDICATIONS</b>	Ventricular Fibrillation Pulseless Ventricular Tachycardia
<b>CONTRAINDICATIONS</b>	Known hypersensitivity Nephritis (inflammation of the kidney)
<b>PRECAUTIONS</b>	Not recommended for responsive patients with CAD May provoke cardiac ischemia and angina
<b>SIDE EFFECTS</b>	Nausea/Vomiting Diarrhea Confusion Pain at IV site
<b>SUPPLIED</b>	20 Units / mL in a vial
<b>ADULT DOSAGE</b>	<b><u>Cardiac Arrest / Ventricular Fibrillation / Pulseless Ventricular Tachycardia</u></b> 40 Units IV push (administered in place of the first or second dose of Epinephrine)
<b>PEDIATRIC DOSAGE</b>	Not recommended for pediatric use
<b>KEY POINTS</b>	<ul style="list-style-type: none"> <li>The half-life of Vasopressin is approximately 10- 20 minutes</li> </ul>

**MEDICATIONS**

**VERSED (Midazolam)**

I	EMT – I	I
P	EMT – P	P

<b>ACTION</b>	Sedative and hypnotic benzodiazepine Induces amnesia
<b>INDICATIONS</b>	Conscious sedation Seizure Facilitate intubation Facilitate pacing / cardioversion
<b>CONTRAINDICATIONS</b>	Intolerance to benzodiazepines Narrow-angle glaucoma Shock Coma
<b>SIDE EFFECTS</b>	<p><b>CNS</b> – amnesia, headache, dizziness, euphoria, confusion, agitation, anxiety, delirium, drowsiness, muscle tremor, ataxia, dysphoria, slurred speech, and paresthesia.</p> <p><b>Cardiovascular</b> – hypotension, PVC’s, tachycardia, vasocagel episode</p> <p><b>Eye</b> – blurred vision, diplopia, nystagmus, pinpoint pupils</p> <p><b>Respiratory</b> – coughing, bronchospasms, laryngospasm, apnea, hypoventilation, wheezing, airway, obstruction, tachypnea</p> <p><b>Skin</b> – swelling, burning, pain at the site of injection</p>
<b>ADULT DOSAGE</b>	2mg IV/IO max initial dose for sedation (may repeat as necessary) 5mg IV/IO max initial dose for seizures (may repeat as necessary) 5mg IV/IO for RSI and Violent Patients <b>Versed may be administered IM or nasally in actively seizing or violent patients whenever IV access is not achieved.</b>
<b>PEDIATRIC DOSAGE</b>	Seizures – 0.1mg/kg IV/IO/IM to a max dose of 5mg 0.2mg/kg Intranasal to a max dose of 10mg

MEDICATIONS		
<b>ONDANSETRON (Zofran)</b>		
	P	EMT – P

<i>ACTIONS</i>	Antiemetic
<b>INDICATIONS</b>	Nausea & vomiting
<b>CONTRAINDICATIONS</b>	Hypersensitivity
<b>SIDE EFFECTS</b>	Drowsiness, vertigo Blurred vision, headache Hypotension
<b>ADULT DOSAGE</b>	4 mg slow IV, IM
<b>PEDIATRIC DOSAGE</b>	Contact Medical Control
<b>KEY POINTS</b>	